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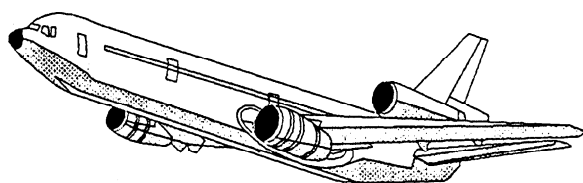
Federal Aviation
Administration

Advisory Circular

AC 120-53

Date: 5/13/91

Crew Qualification and Pilot Type Rating Requirements for Transport Category Aircraft



Operated under
FAR Part 121



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: CREW QUALIFICATION AND
PILOT TYPE RATING REQUIREMENTS
FOR TRANSPORT CATEGORY AIRCRAFT
OPERATED UNDER FAR PART 121

Date: 5/13/91
Initiated by: AFS-200

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1. **PURPOSE.** This advisory circular (AC) provides an acceptable means, but not the only means, of compliance with Federal Aviation Regulations (FAR) regarding qualification and type rating of flight crewmembers operating under Part 121 of the FAR. Included are criteria for determination and approval of training, checking, and currency necessary for safe operation of aircraft in air carrier operations, particularly for pilots who frequently fly different variants of the same type aircraft. This AC also describes the process by which the Federal Aviation Administration (FAA) determines "type rating" requirements applicable to the pilot in command of new or modified aircraft. Details of the systems, processes, and tests necessary to apply this AC are explained in the Appendix. While the criteria of this AC are not mandatory, they describe acceptable means of compliance based on extensive FAA and industry experience with pertinent FAR. Mandatory terms used in this AC such as "shall" or "must" are used only in the sense of ensuring applicability of these particular methods of compliance when the acceptable means of compliance described herein are used. The provisions of this AC do not add or change regulatory requirements, authorize deviations from regulatory requirements, or interpret regulatory requirements. Interpretations of regulatory requirements are issued pursuant to established agency procedures.

2. **FOCUS.** This AC applies to air carriers operating under FAR Part 121 and the Advanced Qualification Program (AQP) Special Federal Aviation Regulation (SFAR). It particularly addresses operators whose flightcrews operate several variants of an aircraft type in a mixed fleet. In addition, it applies to aircraft manufacturers or modifiers who design, test, and certificate transport aircraft or variants of those aircraft, as well as to training centers having programs approved for use under FAR Part 121. The AC may be used by operators seeking credit for prior flightcrew experience with one variant when transitioning to other variants.

3. RELATED READING MATERIAL.

a. FAR Parts 1, 61, 61 Appendix A, FAR 121 Subparts N and O, Appendix E and Appendix F, and Advanced Qualification Program (AQP) SFAR 58.

b. Current editions of the following AC's: AC 61-89, Pilot Certificates: Aircraft Type Ratings; AC 120-35, Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation; AC 120-40, Airplane Simulator and Visual System Evaluation; AC 120-45, Advanced Training Devices (Airplane Only) Evaluation and Qualification; AC 120-46, Use of Advanced Training Devices (Airplane Only);

AC 120-51, Cockpit Resource Management Training; and FAA-S-8081-5, Airline Transport Pilot and Type Rating Practical Test Standards (this Practical Test Standard can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402).

4. DEFINITIONS. Certain definitions are necessary to uniformly apply this AC's concepts. Unless otherwise noted, definitions apply only to this AC. Key definitions are provided below. Other related definitions, such as for "common type rating," are included in the Appendix.

a. Base Aircraft. An operator designated aircraft or group of aircraft used as a reference to compare differences with other aircraft within an operator's fleet.

b. Variant. A variant is an aircraft or a group of aircraft with the same characteristics that have pertinent differences from a base aircraft. Pertinent differences are those which require different or additional flightcrew knowledge, skills, and/or abilities that affect flight safety.

c. Nixed Fleet Flying. Mixed fleet flying is operation of a base aircraft and one or more variants of the same type, common type, or a different type by one or more flight crewmembers, between training or checking events. This may occur when crewmembers routinely fly variants within a given bid line, between alternating bid lines from month-to-month, or when a variant or different type aircraft is flown occasionally between proficiency training or checks.

5. INTRODUCTION.

a. A System for Crew Qualification. The FAA specifies criteria for air carrier crew qualification (training, checking, and currency) for particular aircraft types through FAA Flight Standardization Board (FSB) evaluations and findings. FSB findings are described in reports for specific aircraft types which define criteria to show compliance with applicable FAR. Reports are directives to FAA Flight Standards District Offices for use by FAA principal inspectors and other inspectors. FSB report provisions serve as a basis for FAA's approval of operators' programs and for airmen certification to ensure compliance with the FAR,

b. Changes Needed. In the past, FSB evaluations were done on a one-time basis: Operators were not directly involved except through application and approval of initial programs. Necessary support for the FSB process is provided by the industry, but procedures often vary by manufacturer, individual project, and operator. Because evaluations were done on a case-by-case basis, results could not be accurately predicted until near the time of type certification. Decisions regarding aircraft design, acquisition, crew training, training devices, and simulators were difficult because of uncertainty about FAA requirements. The need to update, revise, and enhance the system for setting and applying requirements for crew qualification is also affected by other factors including:

- (1) Introduction of many more derivative aircraft types.
- (2) Increasing significance of modifications to existing aircraft, particularly with regard to engines or avionics.
- (3) Integration of diverse fleets of aircraft following airline acquisition or mergers.
- (4) Increased dependence on leased aircraft, many of which are configured differently than an operator's basic fleet,
- (5) A wider variety of equipment options available in purchase of new aircraft or retrofit.
- (6) Introduction of new technology cockpit enhancements.

c. Revisions Introduced by this AC. This AC describes necessary revisions and enhancements to the crew qualification process to address uniform, systematic, timely, and comprehensive application of pertinent FAR in a changing and increasingly complex air carrier operating environment. The revised system defines key terms and concepts, establishes tests and processes, and specifies responsibilities of FAA personnel, manufacturers, and operators who apply the system. The AC provides a common method for the industry and FAA to describe, evaluate, and approve particular programs. FAA policies for airmen certification, training, checking, and currency are clarified. This includes defining the role and criteria for designation of type ratings for existing, new, derivative, or modified aircraft. Key provisions of the AC include the following:

- (1) Standard methods and objective tests are defined to formulate crew qualification criteria.
- (2) Comments from operators, manufacturers, and the public are considered in formulating requirements.
- (3) Master requirements are identified for qualification of crews, particularly for those crews who fly or transition between different variants.
- (4) A standardized process is defined to address operator unique fleet differences and compliance methods.
- (5) Provision is made to periodically update FSB criteria when necessary.

6. CONCEPTS. Additional concepts are introduced to uniformly apply the FAR related to crew qualification and differences. Crew qualification requirements for training, checking, and currency are expressed as FAA master requirements and are described in FSB reports for each type, common type, or related type aircraft. Master requirements are expressed either in the form

of master common requirements (**MCR's**) or master difference requirements (**MDR's**) as described in subparagraphs a and b. **MDR's** are stated in terms of minimum acceptable difference levels. Operators show compliance with the FAA **MDR's** through an operator's specific document which lists each particular operator's fleet differences and compliance methods. Operator difference requirements (**ODR's**) specify requirements uniquely applicable to a particular fleet and mixed flying situation and are based on the **MDR's**. The AC's main concepts are summarized in subparagraphs a through d. These and other concepts are more fully described in the appropriate AC attachments to the appendix.

a. Master Common Requirements (**MCR's**). Master common requirements are requirements applicable to crew qualification which pertain to all variants of the same type, common type, or related types. **MCR's** are specified by the **FSB** when an aircraft is originally type certificated and are revised as necessary when variants are developed. When variants exist, **MCR's** specify only those items which are common to all variants.

b. Master Difference Requirements (**MDR's**). Master difference requirements are those requirements applicable to crew qualification which pertain to differences between variants of the same type, common type, or related types. **MDR's** are specified by the **FSB** in terms of difference levels. **MDR's** apply between particular pairs of variants or variant groups and are shown on an **MDR** table.

c. Difference Levels. Difference levels are formally designated levels of training methods or devices, checking methods, or currency methods which satisfy differences requirements or type rating requirements pertinent to FAR Part 121. Difference levels specify FAA requirements proportionate to and corresponding with increasing differences between groups of variants. A range of five difference levels in order of increasing requirements, identified as A through E, are each specified for training, checking, and currency.

d. Operator Difference Requirements (**ODR's**) Operator difference requirements are those operator specific requirements necessary to address differences between a base aircraft and one or more variants, when operating in mixed fleet flying, or when seeking credit in transition programs. **ODR's** include both a description of differences and a corresponding list of training, checking, and currency compliance methods which address pertinent **FSB** and FAR Part 121 requirements.

7 SETTING FAA REQUIREMENTS. **FSB** requirements are set by a process of proposal development, testing, draft requirement formulation, public comment, **FSB** final determinations, and FAA approval.

a. Manufacturer's Proposals. Aircraft manufacturers or modifiers usually initiate proposals for formulation or amendment of **FSB** requirements. This is done in conjunction with application for type certification or supplemental

type certification of an aircraft or variant. The FAA, operators, and, in certain instances, other organizations or individuals may also initiate proposals or amendments.

b. Standardized Tests. A main element of the requirements formulation process is use of standardized testing to determine crew qualification requirements (MCR's and MDR's). One or more of five tests are applied, depending on the proposal to FAA, degree of differences between variants, difference levels sought, and the outcome of any previous tests. Only those tests which are needed are used. Testing leads to assignment of MCR's and MDR's, development of example programs acceptable to FAA, and identification of other necessary supporting information. In certain instances, tests may be waived or difference levels may be assigned based on operational experience.

c. FAA Formulation and Implementation of Requirements. Following testing and formulation of draft requirements, public comment is sought. FSB requirements determinations are then made specifying master common requirements, master difference requirements, and any necessary supporting information. Supporting information may pertain to operator certification, airmen certification, approval of devices and simulators, FAR compliance status of variants, and other items necessary for proper application of master requirements. An FSB report is prepared, and review and approval is completed. The FSB report is distributed to FAA field offices. FSB reports are considered FAA policy for review, approval, certification, and evaluation of operator programs.

d. Revision of Requirements. FSB reports are periodically updated when new variants are introduced, when requested by operators or manufacturers based on operating experience, or when the FAA otherwise determines it to be necessary for safety reasons.

e. Type Ratings. Same, common, or additional type ratings are assigned, based on difference level determinations. For example, an additional type rating is assigned to a variant group when it is determined that level E training is required for one or more variant pairs.

8. OPERATOR COMPLIANCE WITH FAA REQUIREMENTS.

a. Obtaining FSB Information. Operators are advised of pertinent FSB information through FAA certificate holding district offices and FAA principal operations inspectors (POI's). Operators may also obtain FSB information from aircraft manufacturers or modifiers, other operators, or other aviation organizations who maintain awareness of FAA policies.

b. Operator Proposals. As specified by the FAR, operators apply to FAA for approval of training programs, training devices, check airmen, and operations specifications. In addition, operators request FAA to conduct airman certification or request approval of designated examiners. Proposals for each of these items or activities must be consistent with FSB requirements, or alternate approval must be sought. This is to ensure pertinent FAR compliance for specific aircraft types and variants.

c. Operator Compliance Without Mixed Fleet Flying. When variants are not flown or are not used in mixed fleet flying, FAA applies MCR's and other related FSB provisions, and operators comply with those provisions.

d. Operator Compliance With Mixed Fleet Flying. When variants are flown in mixed fleets, FAA also applies, and operators comply with, MDR's and other related FSB differences provisions. Operators accomplish this by identifying a "base" aircraft, describing differences which exist between their base aircraft and variants, and by specifying particular means of compliance to satisfy MDR's. The description of specific differences and compliance methods are identified as that air carrier's ODR's. ODR's constitute the approval basis for an operator's mixed fleet flying program and specify any necessary constraints or permissible credits. Constraints or credits may relate to knowledge, skills, devices, simulators, maneuvers, checks, currency, or any other such factors necessary for safe operations. Constraints or credits may be applied generally, or only to specific variants or crew positions. Once approved, operators' programs are conducted in accordance with these ODR's. ODR proposals are provided to the FAA in a standard tabular format and are approved by FAA principal inspectors only if they meet MDR and other pertinent FSB requirements. ODR's are amended by the operator as base aircraft, variants, training devices, or as other pertinent factors change. Each amendment is approved by the FAA.

e. Transition Credit. In addition to mixed fleet flying, ODR's may be used to permit credit between variants in transition programs, consistent with FSB provisions.

9. FAA APPROVAL OF OPERATOR PROGRAMS.

a. POI Approval. FAA POI's approve operator programs when those programs comply with FSB provisions. If programs less restrictive are proposed, POI's advise the applicant that the program must be revised to comply, a request for change of the MCR's or MDR's must be initiated, the difference between variants must be reduced or eliminated, or an alternate approval must be sought. Programs more restrictive than FAA requirements may be approved at the operator and POI's discretion.

b. Limitations of POI Authority. When applicable, POI's may approve programs within provisions of the FSB report and this AC. AC provisions apply because certain other general constraints are identified such as a limitation on the number of different variants which may be used in mixed fleet flying. POI's may not approve programs outside the bounds of FSB or AC provisions without authorization of the FAA Air Transportation Division, AFS-200. Variation from FSB or AC provisions is approved by AFS-200 only when an equivalent level of safety can be demonstrated.

10. APPLICATION OF FSB REQUIREMENTS TO AIRMEN CERTIFICATION.

a. Evaluation Items or Maneuvers. FSB requirements for airmen certification are specified and knowledge, skills, abilities, maneuvers,

performance criteria, or other relevant items for type ratings, proficiency checks, other checks or testing are identified when necessary. This is appropriate to address any type or variant specific factors related to FAR Part 61, FAR Part 121, or SFAR compliance.

b Evaluator Qualification. FSB requirements identify any type or variant specific criteria pertinent to FAA inspectors, aircrew program managers, aircrew program designees, check airmen, instructors, or other evaluators.

11. TRAINING DEVICE AND SIMULATOR APPROVALS.

a. Standard Devices or Simulators. Standardized training methods, devices, or simulators are associated with each of the difference levels. Devices or simulators are approved for particular operators by POI's consistent with FAA National Simulator Evaluation Team (NSET) determinations and FSB master requirements.

b Special Criteria. In some instances, standard device or simulator criteria may not be appropriate for new technology, particular variant combinations, or other situations. The FSB may specify additional criteria in FSB reports in these instances.

12. REVIEW, APPROVAL, AND APPEAL OF FAA DECISIONS. A process for review of FSB evaluations, approval of FSB reports, and appeal of FSB findings is specified. The FAA Director, Flight Standards Service, AFS-1, assigns responsibility to resolve appeals.

13. OTHER MEANS OF COMPLIANCE. In the event operators or manufacturers elect not to apply criteria of this AC and FSB findings, provision is made for approval of an alternate means of compliance. Demonstration of an equivalent level of safety to that provided by this AC rests with the applicant in attempting to seek such alternate approval.

14. SAFETY AND OTHER BENEFITS INTENDED. Provisions of this AC are intended to enhance safety by:

a. Standardizing FAA's application of pertinent FAR related to crew qualification and differences.

b. Providing a common method of assessment of operators' and manufacturers' programs.

c. Directly relating crew qualification and training requirements to fleet characteristics, operating concepts, and crew assignments.

d Permitting better planning and management of fleets, crew assignments, and training resources by knowing in advance what FAA requirements apply, what training resources or devices are needed, and what alternatives are possible.

- e. Permitting timely and consistent decisions about fleet acquisition, integration, modification, or phaseout related to crew qualification or crew assignments.
- f. Permitting manufacturers to design aircraft which take advantage of new technology or are common with existing variants, as appropriate to a particular operator's fleet.
- g. Encouraging cockpit standardization by crediting commonality and identifying necessary constraints when differences exist.
- h. Providing a framework for application of suitable credit; or constraints to better address new technology and future safety enhancements.


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CONTENTS

	<u>Page No.</u>
1. PURPOSE	1
2. FOCUS	1
3. RELATED READING MATERIAL	1
4. INTRODUCTION	1
5. DEFINITIONS	4
6. CONCEPTS	9
6.1 Integrated System for Crew Qualification	9
6.2 Master Common Requirements	12
6.3 Master Difference Requirements	13
6.4 Difference Levels	17
6.5 Difference Training Levels	21
6.6 Difference Checking Levels	24
6.7 Difference Currency Levels	27
6.8 Operator Difference Requirements	31
7. FORMULATION OF FSB REPORTS, MASTER COMMON REQUIREMENTS (MCR's), MASTER DIFFERENCE REQUIREMENTS (MDR's) AND DESIGNATION OF TYPE RATINGS	37
7.1 Requirements Formulation Process Overview	37
7.2 Proposals for MDR's , MCR's , Example ODR's , and Special Requirements	39
7.3 Difference Level Tests	40
7.4 Flight Standardization Board Assessments and Proposal Formulation	47
7.5 Public Comment	47
7.6 FSB Final Determinations and Findings	48
7.7 FSB Report Preparation, Distribution, and FAA Application	50
7.8 FSB Report Revision	51

CONTENTS (CONT.)

Page No.

8.	AIR CARRIER APPLICATION OF FSB PROVISIONS, PREPARATION, USE, AND REVISION OF ODR's	53
8.1	General	53
8.2	Application of Master Common Requirements (MCR's)	55
8.3	Application of Master Difference Requirements (MDR's) and Preparation and Use of Operator Difference Requirements (ODR's)	56
8.4	Selecting Base and Variant Aircraft	61
8.5	Identification of Differences and Analysis of Effects of Differences	61
8.6	Identification of Compliance Methods	62
8.7	When Proposed ODR Compliance Methods Do Not Meet MDR's	62
8.8	Maximum Number of Variants	62
8.9	Application, Review, and Approval	63
8.10	Implementation Provisions (Transition Period)	63
8.11	ODR Revision	63
9.	FAA REVIEW AND APPROVAL OF OPERATOR PROGRAMS	64
9.1	General	64
9.2	Application of MCR's	65
9.3	Operator Application of ODR's	66
9.4	Base and Variant Identification	68
9.5	Approval of ODR's	70
9.6	Principal Inspector Uncertainty Regarding Program Compliance	71
9.7	Proposals That Do Not Comply with FSB Provisions	71
9.8	FSB Revision of MCR's, MDR's, or Other FSB Provisions	71
9.9	ODR Distribution and Record Retention	72
9.10	ODR Table Use for Transition Program Credit	72
9.11	Coordination with APM's, ACI's, and Geographic Inspectors	72
9.12	Proving Tests	72
9.13	Line Oriented Flight Training (LOFT)/Line Operational Simulation (LOS).	73
9.14	Initial Operating Experience (IOE) and Supervised Line Flying (SLF)	73

CONTENTS (CONT.)Page No.

9.15	Limitations on the Total Number of Variants . . .	73
9.16	Compliance Checklist for CHDO's	75
9.17	Implementation and Transition Provisions	75
9.18	Other Applications of This AC's Provisions . . .	75
9.19	Aircraft Which Do Not Have an FSB Report	76
9.20	Air Carriers That Elect Not to Apply This AC . .	76
9.21	Air Carrier Mergers	76
10.	APPLICATION OF REQUIREMENTS TO AIRMEN CERTIFICATION .	77
10.1	General	77
10.2	Checking Specifications	77
10.3	Surveillance	77
10.4	Oral and Written Tests	77
10.5	Checks Regarding Complex Systems	78
10.6	Proficiency Checks, Section 121.441 of the FAR or AQP Proficiency Evaluations	78
10.7	Operating Experience	79
10.8	Recurrent Checking	79
11.	TRAINING DEVICE AND SIMULATOR APPROVAL.	79
11.1	Training Device and Simulator Characteristics .	79
11.2	Aircraft/Simulator/Device Compatibility	79
11.3	Simulator and Device Approvals	80
12.	APPROVAL AND RECONSIDERATION OF FAA DECISIONS	80
13.	OTHER MEANS OF COMPLIANCE	81
ATTACHMENT 1	- Flight Standardization Board Report Contents	83
ATTACHMENT 2	- Master Difference Requirements Table - Example	85
ATTACHMENT 3	- Operator Difference Requirements Table - Example	87
ATTACHMENT 4	- Type Rating and Difference Level Tests - Planning and Application.	97

**APPENDIX 1. CREW QUALIFICATION AND PILOT TYPE RATING REQUIREMENTS FOR
TRANSPORT CATEGORY AIRCRAFT OPERATED UNDER FAR PART 121 -
SYSTEM, PROCESS, AND TEST DESCRIPTIONS.**

1. **PURPOSE.** This **appendix** provides a comprehensive description of a **system** for crew qualification outlined in this AC. It includes definitions, criteria, processes, tests, methods, and procedures necessary for uniform application of the system.

2. **FOCUS.** The **appendix** applies to and is used by:

a. Aircraft manufacturers or modifiers who design, test, and certificate Part 25 transport aircraft or variants of those aircraft,

b. Air carriers who operate under Part 121, including the AQP SFAR if applicable,

c. Operator, manufacturer, or other training centers having programs approved for use under Part 121, or

d. FAA offices and inspectors administering programs under Part 121.

3. **RELATED READING MATERIAL.** FAR Parts 1, 61.31, 61.57, 61.58, 61.63, 61.153, 61.157, 61 Appendix A, 121.401, 121.403, 121.405, 121.407, 121.409, 121.413, 121.417, 121.418, 121.419, 121.421, 121.422, 121.424, 121.427, 121.433, 121.434, 121.437, 121.439, 121.440, 121.441, 121 Appendix E, 121 Appendix F, Advanced Qualification Program (AQP) SFAR; current editions of AC 61-89, AC 120-35, AC 120-40, AC 120-45, AC 120-46, AC 120-51; and FAA-S-8081-5 Practical Test Standard.

4. **INTRODUCTION.**

4.1 A Comprehensive System for Crew Qualification. This AC and **appendix** provide a means to systematically address requirements for training, checking, and currency within rules prescribed in Federal Aviation Regulations (FAR) Part 121 Subpart N and O including Appendices E and F. These provisions also apply to those air carriers who have programs approved under the Advanced Qualification Program (AQP) Special Federal Aviation Regulation (SFAR). Definitions, criteria, processes, procedures, tests, and methods are consistent with and clarify application of current rules and the SFAR in particular situations for specific aircraft types and

variants. A comprehensive system is provided for use by the Federal Aviation Administration (FAA) and industry to describe, evaluate, and approve use of particular aircraft and operator programs. The respective roles of airmen certification, training, checking, and currency are clarified. This includes defining the role and criteria for designation of type ratings for existing, new, derivative, or modified aircraft. The system is particularly suited to addressing differences programs, mixed fleet flying, and transition between variants. The system aids in assuring attainment and maintenance of knowledge, skills, and abilities that are needed by flight crews to safely operate assigned aircraft, including variants. The system provides a standardized means to credit or constrain mixed fleet flying of variants or transition between variants.

4.4 Master Requirements Set by FAA. The system is based on application of standardized requirements for operation of new type, common type, related types, or variants of those aircraft. Requirements are set by the FAA's Flight Standardization Board (FSB) with industry and public comment. Requirements are set in the form of master common requirements (MCR's) or master difference requirements (MDR's). MCR's are for new aircraft or for those requirements which are common to any variant. MDR's address differences and are for mixed fleet flying of variants or for transition between variants. master common requirements or master difference requirements address specification of any necessary pilot type ratings.

4.5 Specification of Constraints or Credits. The system permits the specification of any type or variant specific constraints or permissible credits. Constraints or credits may relate to knowledge, skills, abilities, devices, simulators, maneuvers, checks, currency, or any other such factors necessary for safe operations. Constraints or credits may be applied generally to a type, common types, or related types, or only to specific variants, particular crew positions, or other situations or conditions.

4.6 Recognition of Unique Operator Characteristics. The system recognizes the unique characteristics of individual air carriers while achieving uniformity in application of broad FAA safety standards. This is done by tailoring individual operators unique requirements to a particular fleet and situation within uniform bounds determined by FAA master requirements. FAA principal inspectors approve each operator's unique requirements within FAA master requirements. Operator unique requirements accommodate particular combinations of aircraft or variants flown, crew assignment policies, training methods and devices, and other factors which relate to application of the FAA master requirements to safe operations for a particular operator. Accordingly, the system preserves operator flexibility while standardizing the FAA's role in review, approval, and

5/13/91

AC 120- 53
Appendix 1

monitoring of training, checking, and currency programs under Part 121 and in conducting airmen certification.

4.7 Basis for Requirements. The determination of type rating, differences training, checking and currency requirements focus on basic operation of aircraft in the National Airspace System (NAS) under both instrument flight rules (IFR) and visual flight rules (VFR). Included are all flight phases from preflight to shutdown under both normal and non-normal conditions. Assessments are based on use of standard US or ICAO navigation aids and procedures.

4.8 Relationship to other FAA Policies. Although this AC and FSB requirements in some instances address particular types of operations or specific aircraft systems such as use of flight guidance control systems for Category II/III instrument approaches, long range navigation, and other topics, these issues are primarily addressed by criteria of other AC's. This AC and FSB requirements address such issues only to the extent necessary to assure that crews are qualified to operate pertinent systems or equipment as part of initial or continuing qualification for a particular type or variant.

4.9 Other Applications of this AC. While the primary application of this AC is for air carriers and crews operating under Part 121, and manufacturers and modifiers of those aircraft, the provisions may also be used by training centers having programs approved under Part 121. Procedures for determining type rating requirements may be applied to all U.S. certificated transport category airplanes even though not used in Part 121.

5/13/91

5. DEFINITIONS.

5.1 Aircraft Evaluation Group (AEG). FAA, Flight Standards organization which sets training, checking, currency, type rating, master minimum equipment list (MMEL), and maintenance standards (maintenance review boards) for assigned aircraft types. AEG's also address operational aspects of aircraft type certification and resolution of service difficulties.

5.2 Base Aircraft. An operator designated aircraft or group of aircraft used as a reference to compare differences with other aircraft within an operator's fleet.

5.3 Common Type Rating. A single pilot type rating assigned to two or more aircraft which have separate type certificates and are not related as derivative aircraft (e.g., B-757 and B-767).

5.4 Currency. Currency as used in this advisory circular is that recent experience necessary for safe operation of aircraft types or variants as designated by the FSB. When addressing flight experience required by Section 121.439, currency is considered to have the same meaning as recency of experience (also see Recency of Experience).

5.5 Configuration. Aircraft physical features that are distinguishable by pilots with respect to differences in systems, cockpit geometry, visual cutoff angles, controls, displays, aircraft geometry and/or number of required crew.

5.6 Difference. A change which may affect crew knowledge, skills, and/or abilities, or otherwise alters the crew interface with the aircraft (e.g., control/indicator relocation, addition, deletion, and/or change in function; modified panel scan requirements; increase/decrease in operational tasks; change/improvement in technology; etc.).

5.7 Difference Levels. Difference levels are formally designated levels of training methods or devices, checking methods, or currency methods which satisfy differences requirements or type rating requirements pertinent to Part 121. Difference levels specify FAA requirements proportionate to and corresponding with increasing differences between groups of variants. A range of five difference levels in order of increasing requirements, identified as A through E, are each specified for training, checking, and currency.

5.8 Differences Training. The training required for crewmembers and dispatchers who have qualified and served on a particular airplane to

5/13/91

AC 120-53
Appendix 1

assure the necessary knowledge and skills to safely serve in the same capacity on a particular variant of that airplane. (See FAR Part 121, Subpart N.)

5.9 Flight Characteristics. Flight characteristics are handling qualities or performance characteristics perceivable by a flightcrew. Flight characteristics relate to the natural aerodynamic response of an airplane, particularly as affected by changes in configuration and/or flight path related parameters (e.g., flight control use, flap extension/retraction, airspeed change, etc.).

5.10 Flight Operations Evaluation Board (FOEB). The FAA board responsible for preparation and revision of MMEL's.

5.11 Flight Standardization Board (FSB). The FAA board responsible for specification of training, checking, currency, and type rating requirements if necessary for U.S. certificated civil aircraft.

5.12 Handling Characteristics. Means the manner in which the aircraft responds with respect to rate and magnitude of pilot initiated control inputs to the primary flight control surfaces (e.g., ailerons, elevator, rudder, spoilers, etc.).

5.13 Major Change. A change or changes within an aircraft type or related types which significantly affect crew interface with the aircraft such as: flight characteristics; normal, non-normal or emergency procedures; recall action items; design or number of propulsion units; change in number of required crew; etc.

5.14 Master Common Requirements (MCR's). Master common requirements are requirements applicable to crew qualification which pertain to all variants of the same type, common type, or related types. MCR's are specified by the FSB when an aircraft is originally type certificated and are revised as necessary when variants are developed. When variants exist MCR's specify only those items which are common to all variants.

5.15 Master Difference Requirements (MDR's). Master difference requirements are those requirements applicable to crew qualification which pertain to differences between variants of the same type, common type, or related types. MDR's are specified by the FSB in terms of difference levels. MDR's apply between particular pairs of variants or variant groups, and are shown on an MDR table.

5.16 Minor Change. A change other than a major change, as specified in 5.13.

5.17 Mixed Fleet. A particular operator's fleet which contains a base aircraft and one or more variants of a same type, common type, or related type aircraft.

5.18 Mixed Fleet Flying. Mixed fleet flying is operation of a base aircraft and one or more variants of the same type, common type, related type, or a different type by one or more flightcrew members, between training or checking events.

5.19 Operating Experience. Initial operating experience (IOE) acquired on a particular aircraft type as provided for by Section 121.434.

5.20 Operational Characteristics. As used with respect to aircraft, means those features which are distinguishable by limitations, flight characteristics, normal procedures, non-normal procedures, alternate or supplementary procedures, or maneuvers.

5.21 Operator Difference Requirements (ODR's). Operator difference requirements are a formal description of differences between variants flown by a particular operator, with a corresponding list of FAR compliance methods pertinent to training, checking, and currency.

5.22 Proficiency. Proficiency is the possession of sufficient knowledge of aircraft systems, characteristics, limitations, procedures, and necessary skills to competently and safely perform assigned duties. Performance of assigned duties is considered to include the ability to accomplish required maneuvers and procedures within or in accordance with established criteria.

5.23 Qualification. The combination of applicable experience, training, checking, certification, currency, and any other special requirements as defined in Part 121, Subpart O, or the Advanced Qualification Program (AQP) Special Federal Aviation Regulation (SFAR), which permit authorization to serve as a crewmember for a specific crew position in air carrier operations.

5.24 Recency of Experience. With respect to flight experience as required by Section 121.439, means an airman's completion of the required number of takeoffs and landings as manipulator of controls within the preceding 90 days, in an aircraft of same type, common type, or related type as specified by the FSB. With respect to training means the number of days since completion of an approved flight, ground, or simulator training program and completion of a pertinent check, if applicable. With respect to other applications means meeting pertinent FSB criteria as designated in

5/13/91

AC 120- 53
Appendix 1

FSB reports for a given type, common type, or related type aircraft. Recency of experience is considered to have the same meaning as the term currency when used in this AC and FSB reports (also see Currency).

5.25 Related Type Rating. A different pilot type rating assigned to a variant with the same or an amended type certificate (e.g., B-747-400 is related to the B747-100/300) or a variant with a different type certificate.

5.26 Same Type Rating. A single pilot type rating assigned to two or more variants which have a single type certificate (e.g., DC-8 for the DC-8-50, DC-8-60, and DC-8-70 series).

5.27 Series. As used with respect to aircraft, means those aircraft with a single type certificate which have a specific derivative designation usually defined by the manufacturer and which usually result in an amended type certificate (e.g., B-737-100, B-737-200, and B-737-300).

5.28 Supervised Line Flying (SLF). A specific type of IOE during which a pilot occupies a specific crew position and performs particular assigned duties for that crew position which are related to postqualification skill enhancement.

5.29 Training Footprint. A training footprint is a summary description of a training program, usually in short tabular form, showing training subjects, modules, procedures, maneuvers or other program elements which are planned for completion during each day of training.

5.30 Type Certificate (TC). Original TC: A new type certificate for an aircraft for which no previous type certificate has been issued. Amended TC: An existing type certificate modified to include changes. Supplemental TC: A type certificate issued to modifiers of aircraft without change to the existing type certificate for that aircraft.

5.31 Type Rating (See Part 1 of the FAR, "Type"). A type rating is a "one time" permanent endorsement on a pilot certificate, recorded by the FAA, which is required by the FAR in order to serve as pilot-in-command of a U.S. civil large or turbojet aircraft. As used with respect to the certification, ratings, privileges, and limitations of airmen, means a specific make and basic model of aircraft, including modifications, that do not change its handling or flight characteristics. The term "new" type rating is used when a pilot type rating is first assigned during the initial certification of a new aircraft type. The terms "different" or "separate" type rating are used when an additional pilot type rating is assigned to a variant which does not qualify for a "same" or "common" type

rating.

5.32 Variant. A variant is an aircraft or a group of aircraft with the same characteristics that have pertinent differences from a base aircraft. Pertinent differences are those which require different or additional flight crew knowledge, skills, and/or abilities that affect flight safety.

5/13/91

AC 120-53
Appendix 1

6. CONCEPTS.

6.1 An Integrated System for Crew Qualification.

6.1.1 System Elements. An integrated FAA/manufacturer/operator system and process is established for crew qualification to uniformly determine appropriate requirements, apply requirements, and meet those requirements on a continuing basis. The system addresses crew qualification for specific types, common types, related types, and particularly addresses differences between variants. The system is based on FAR Parts 1, 61, 121, may be used in conjunction with the AQP SFAR, and includes:

- a. definitions of terms, concepts, roles, and responsibilities;
- b. criteria for testing, establishment of requirements, and approval of programs; and
- c. processes to determine, apply, comply, and revise requirements for crew qualification applicable to training, checking, and currency.

6.1.2 System Overview. The system uniformly applies FAA master requirements in a way which may be tailored to particular aircraft types, variants, and an operator's unique situation or fleet. This is accomplished through specification and FAA approval of unique operator and fleet requirements for each operator based on FAA master requirements. FAA master requirements are developed based on objective criteria and tests, with industry support for analysis, testing, and public comment. FAA master requirements are described in FSB reports for each type, common type, or related type aircraft. FAA master requirements are expressed either in the form of master common requirements (MCR's) or master difference requirements (MDR's) as described in sections 6.2 and 6.3. MDR's are stated in terms of minimum acceptable difference levels between variants. MCR's and MDR's directly pertain to FAA offices' and inspectors' application of rules and policies to crew qualification. Thus, MCR's and MDR's indirectly apply to operators and airmen through the FAA approval process. Operators comply with MCR's and MDR's as a byproduct of training program, checklist, manual, airmen certification, and other such approvals. Operators comply with MDR's through the use of unique operator difference requirements (ODR's) which are tailored to that operator's programs and are approved by FAA. ODR's specify requirements uniquely applicable to a particular air carrier's fleet and mixed flying situation but are based on and comply with MDR's. ODR's are described in an operator specific document which identifies a base aircraft, differences between variants, and that operator's compliance methods for each particular variant or variant group. ODR's are described in section 6.8. ODR preparation and

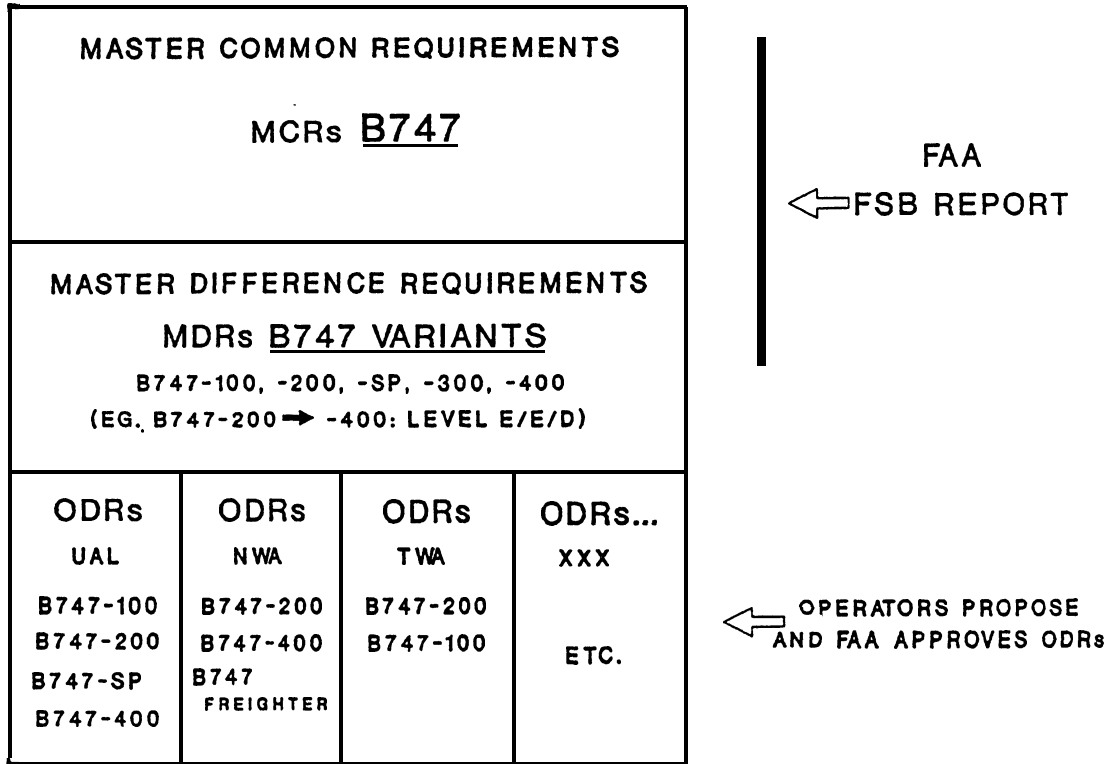
AC 120- 53
Appendix 1

5/13/91

use is described in section 8 and approval of ODR's by FAA is in section 9. 6.1.3 An example of the relationship between MCR's, MDR's, and ODR's for the B747 is shown in figure 6-1 .

FAR 121 TRAINING, CHECKING, AND CURRENCY

(APPLICATION OF FSB REQUIREMENTS)



ODRs SHOWN ARE EXAMPLES ONLY

ODRs = OPERATOR DIFFERENCE REQUIREMENTS

FIGURE 6-1

6.2 Master Common Requirements (MCR's).

6.2.1 MCR Applicability. Master common requirements are requirements applicable to crew qualification which pertain to all variants of the same type, common type, or related types. They include requirements for training, checking, and currency for new aircraft and for common application to any variant when variants exist.

6.2.2 MCR Content. Master common requirements set training, checking, and currency requirements necessary to apply FAR to a particular type or types. For example, training programs typically acceptable to FAA are described, particular methods acceptable for accomplishing various check maneuvers applicable to FAR 61, Appendix A; FAR 121, Appendix F; or AQP flight qualification events are shown, criteria for acceptable maneuver performance are established if necessary, and maneuvers which are not applicable or which may be waived are identified. Any special knowledge or flight characteristics requiring training or evaluation are described. Where MCR's do not need to specify type unique information, the FAR and FAA's general policies for training, practical test standards, and other such references directly pertain without the need for additional specification, interpretation, clarification, or adjustment. MCR's are formulated in accordance with established FAA policies for initial, transition, upgrade, recurrent, and differences training and checking. Recurring requirements are consistent with initial requirements unless otherwise specified by the FSB.

6.2.3 MCR Formulation and Description. MCR's are formulated by the FAA Flight Standardization Board (FSB) designated for each aircraft type, common type, or related types. MCR's are originally specified when an aircraft is first type certificated. MCR's are formulated using standardized tests and evaluations in conjunction with the type certification or supplemental type certification process. MCR's are based on an applicant's (usually an aircraft manufacturer) proposal, FAA evaluation of that proposal, operational experience, and test results when tests are necessary. FSB determinations also consider operator recommendations, safety history, public comment, and other relevant information. MCR's are described in provisions of an FSB report.

6.2.4 MCR Revision. MCR's are periodically revised and kept current as necessary. MCR's are revised when variants are developed or modified, when tests or operational experience show a need for revision, when requested by operators or manufacturers and evidence indicates the need to make revisions, or when rules or FAA policies change. MCR's are revised by a process similar to that used for initial formulation of requirements.

5/13/91

AC 120-53
Appendix 1

6.2.5 MCR Use. FAA field offices use the MCR's as the basis for approval of individual operator's programs under the provisions of Part 121 and airmen certification under Parts 61 and 121. For AQP, MCR's aid in the assessment of an operator's curriculum and flight qualification events.

6.3 Master Difference Requirements (MDR's).

6.3.1 MDR Applicability. Master difference requirements are those requirements applicable to crew qualification which pertain to differences between variants of the same type, common type, or related types. MDR's specify the minimum acceptable difference levels between variants or variant groups that may be approved for operators. One variant or variant group is selected as a reference for comparison purposes and is considered a base aircraft. Difference levels between the base aircraft and other variants then specify the minimum difference requirements to be met for crew qualification. Variant groups describe major differences in a particular fleet rather than specifying each possible configuration and combination of configurations between variants or variant groups. MDR's are specified when at least one variant in addition to the original model is type certificated. MDR's may also pertain to common type qualification when a common type rating is assigned or to related types of derivative aircraft. MDR's are specified in terms of difference levels described in section 6.4 and are shown on an MDR table.

6.3.2 MDR Content. MDR's specify the minimum Part 121 training, checking, and currency acceptable to the FAA for crew qualification regarding differences. This includes any necessary methods, devices, or simulators required to safely accomplish mixed fleet flying or transition between variants.

6.3.3 MDR Formulation, Description, and Revision. MDR's are formulated, described, and revised by the FSB in a manner similar to MCR's. However MDR's are only specified in provisions of an FSB report when variants exist.

6.3.4 MDR Use. MDR's are used in a manner similar to MCR's, except that MDR's are applied to specific air carriers through formally described operator difference requirements (ODR's) which may be tailored to each operator. FAA field offices use the MDR's as the basis for approval of individual operator's differences programs for mixed fleet flying under the provisions of Part 121 Subparts N and O or the AQP SFAR. In some instances MDR's are also the basis for approval of initial or transition programs where credit for previous training or experience with other variants is .

sought.

6.3.5 The MDR Table. An example of typical Master Difference Requirement for the B737 is shown in the table in figure 6-2. In an MDR table requirements are shown for each pair of variants or variant groups by notations in each element of corresponding columns and rows of the table. Each element of the table identifies the minimum differences training, checking, and currency requirements applicable to mixed fleet flying or transition between the referenced variant pair. Any special requirements or situations are shown by footnotes. The MDR table is read by identifying a pertinent base aircraft and particular variant for which requirements are sought, noting the minimum difference levels which correspond to the pertinent column and row, and identifying special requirements shown by footnotes, if applicable.

MASTER DIFFERENCE REQUIREMENTS (MDR) TABLE

AIRPLANE TYPE RATING: B737		FROM AIRPLANE				
		B737 BASIC B737-100/200 (SP77)	B737-200 ADV	B737-300	B737-400	B737-500
T O A I R P L A N E	B737 BASIC B737-100/200 (SP77)	A/A/A (2) NAV - B/B/C (6) PMS - C/B/C	B/A/B (2) NAV - B/B/C (6) PMS - C/B/C	C*/C*/D	C*/C*/D	C*/C*/D
	B737-200 ADV	B/A/B (1) PDCS - C/B/C (2) NAV - B/B/C (4) AFCS - C/B/C (6) PMS - C/B/C	A/A/A (1) PDCS - C/B/C (2) NAV - B/B/C (4) AFCS - WC (6) PMS - C/B/C	C*/C*/D (1) PDCS - B/B/C (2) NAV - B/B/C	C*/C*/D (1) PDCS - B/B/C (2) NAV - B/B/C	C*/C*/D (1) PDCS - B/B/C (2) NAV - B/B/C
	B737-300	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	A/A/A (3) EFIS - WC	A/A/B (3) EFIS - WC	A/A/B (3) EFIS - WC
	B737-400	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	A/A/B (3) EFIS - C/B/C	A/A/A (3) EFIS - C/B/C	A/A/B (3) EFIS - C/B/C
	B737-500	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	A/A/B (3) EFIS - WC	A/A/B (3) EFIS - C/B/C	A/A/A (3) EFIS - C/B/C

Notes:

C* - Denotes level C training or checking which at least requires use of specific level C training devices with detailed characteristics specified in the FSB report.

(1) Installation of Performance Data Computer System (PDCS) requires additional training, and currency.

(2) Installation of INS or Omega Navigation System (ONS) requires additional training, checking, and currency.

(3) Systems device required for EFIS (if applicable)

(4) Installation of AFCS requires additional training, checking, and currency.

(5) If the FMS on the 737-300/400/500 airplane retains only partial functions (such as SWA configuration) training, checking, and currency levels may be reduced.

(6) Installation of Performance Management System (PMS) requires additional training and currency.

FIGURE 6-2

6.3.6 Use of Higher or Lower Difference Levels. Operators must satisfy difference requirements by using the methods acceptable for the specified level or a higher level. Lower level methods may be used in addition to the required levels but may not substitute for the required level or be used exclusively instead of the required level.

6.3.7 Differences Within a Variant Group. Differences may exist even within an individual variant group shown on an MDR table, such as within the B737-200 series. MDR elements may thus show requirements from one B737-200 to another B737-200 or footnotes may be identified. Such requirements however, apply only if pertinent differences exist between those variants.

6.3.8 More than Two Variants. When crew assignments apply to more than two variants, each pertinent requirement of the MDR table applies. Application of multiple requirements for flying many variants and certain limits related to flying large numbers of variants are described in section 9.15.

6.3.9 Base Aircraft. Base aircraft are identified by the operator and are typically the first variant for which crewmembers are qualified, or are the variant of which an operator has the largest number. Base aircraft selection is addressed in section 9.4.1.

6.3.10 Special Requirements.

a. MDR Footnotes. Footnotes can be used to credit, constrain, or set alternate difference levels when special situations apply. Use of footnotes permits accommodation of variations in installed equipment, options, crew knowledge or experience related to other variants or types, training methods or devices, or other factors that are not addressed by basic levels between variant groups. For example, a footnote may allow credit or apply constraints to use of a particular flight guidance control systems (FGCS), flight management systems (FMS), or electronic flight instrument systems (EFIS), which is installed on some aircraft within a variant group. Footnotes are an appropriate means to address requirements which relate to specific systems (e.g., flight director, INS, FMS) rather than a particular variant group. In such instances, generic knowledge or experience with the particular system may be readily transferable between variants or types. Footnotes also may be used to set different requirements for initial training or checking rather than for recurrent training or checking. When necessary, footnotes are fully described in the body of FSB reports.

5/13/91

AC 120-53
Appendix 1

b. Other Limitations. Other limitations may occasionally be identified within a difference level (e.g., C*/C*/D). The asterisk following the difference level in such instances identifies a special requirement or limitation pertaining to a particular training method or device. Such notes typically relate to acceptable training device characteristics when NSET or standard criteria of this AC are not available to appropriately address a particular situation.

6.3.11 MDR's for aircraft with common or related type ratings. A single FSB report and MDR table may apply to aircraft that are assigned a common type rating or for related types. For example, a single MDR table may cover both the B-767 and B-757 which have a common type rating. When level E training is required for a variant and an additional type rating is assigned within the fleet, such as for the B747 and B747-400, a single MDR table for all variants still applies.

6.3.12 Example Use of an MDR Table. Figure 6-2 shows typical use of the MDR table. A crewmember who primarily flies a B-737-100 as a base aircraft (shown in top row) and also flies a B-737-200 ADV as a variant (left column) in a single bid line during a month's flying is considered to be performing mixed fleet flying. The MDR table identifies minimum requirements which apply (levels B/A/B) as shown by the element of the table which is in both the B737-100 base aircraft column and B-737-200 variant row. Thus, to satisfy FAA requirements for differences, at least level B training, level A checking, and level B currency must be achieved. If PDCS, PMS, AFCS, or NAV differences are not a factor between the two variants, footnotes shown in that element amending the levels do not apply. If one or more of these differences do apply, then the credits permitted or constraints required by the footnote apply and are used in lieu of the basic levels. For example, if the B737-200 ADV had PDCS installed and the B737-100 did not, then the minimum difference levels acceptable would be C/B/C.

6.3.13 Minimum acceptable difference levels are assigned based on standard tests or evaluations summarized in section 7 and described in attachment 4.

6.4 Difference Levels.

6.4.1 General Description. Difference levels are formally designated levels of training methods or devices, checking methods, or currency methods which satisfy differences requirements or type rating requirements pertinent to Part 121 Subpart N or O. Difference levels specify FAA requirements proportionate to and corresponding with increasing differences between variants or groups of variants. A range of five difference levels in order of increasing requirements, identified as A through E, are each

5/13/91

specified for training, checking, and currency. MDR's are specified in terms of difference levels. Use of difference levels provides a means to assure uniform compliance with differences provisions of Part 121 and the AQP SFAR. Difference levels apply to operator compliance with FAA requirements necessary to assure safe operations when operators conduct mixed fleet flying. Difference levels also may be used to credit knowledge, skills, and abilities applicable to an aircraft in which an airman is already qualified and is current, during initial, transition, or upgrade training for other related variants.

6.4.2 Basis for Levels. Difference levels apply when a difference exists between variants that affects knowledge, skills, or abilities required of a flight crewmember pertinent to flight safety. If no differences exist, or if differences exist but do not affect flight safety, or if differences exist but do not affect knowledge, skills, or abilities, then difference levels are not assigned or applicable to crew qualification. When difference levels apply, each difference level, A through E, is based on a scale of differences in design features, systems, or maneuvers. The effects of differences consider both flight characteristics and procedures since flight characteristics address handling qualities and performance while procedures include normal, non-normal, alternate (supplementary), and recall items. Limitations are addressed as a subset of various procedures. Difference levels are generally characterized by the following distinctions:

- a. Level A - variants which are "functionally equivalent,"
- b. Level B - variants which are "functionally similar,"
- c. Level C - variants having "part task differences,"
- d. Level D - variants having "full task differences," and
- e. Level E - variants which are "significantly different."

6.4.3 Relationship Between Training, Checking, and Currency Levels. While particular variants are often assigned the same level (e.g., C/C/C) for training, checking, and currency, such assignment is not necessary. Levels may be assigned independently. For example, a variant may be assigned level C for training, level B for checking, and level D for currency (e.g., C/B/D).

6.4.4 Type Ratings Related to Difference Levels. Within the difference level system, type ratings are assigned or retained as an adjunct to pilot certification in certain situations. The specific role, criteria for, and

5/13/91

AC 120-53
Appendix 1

application of the type rating is established and clarified. The application of type rating is based on existing definitions and Part 1, and is consistent with Parts 61 and 91 and criteria in Advisory Circulars 61-57A, 61-89B, the FAA Airline Transport Pilot (ATP) and Type Rating Practical Test Standard, and FAA Order 8400.10. The type ratings are retained as a means for the FAA to permanently track pilot-in-command qualification on a one time basis for aircraft types which retain commonality in handling qualities and at least some equivalence of systems.

6.4.5 Assignment of Type Rating Designations. Variants having the same or an amended type certificate are assigned the same type rating if training differences are less than or equal to level D. Common type ratings are assigned to variants with different type certificates which have training differences less than or equal to level B. Once assigned, however, common type ratings may be retained if differences training for any additional variant remains less than or equal to level D. Variants are assigned an additional type rating when difference training level E is required for one or more variant groups. When an additional type rating is assigned as a result of one or more variants requiring level E, type ratings may be assigned to variants consistent with a logical grouping of the most similar variants.

6.4.6 Difference levels are summarized in figure 6-3 for training, checking, and currency. Definitions of devices or simulators acceptable for particular difference levels are listed in the Advanced Qualification Program Advisory Circular. Complete descriptions of difference levels are given in sections 6.5 for training, 6.6 for checking, and 6.7 for currency.

DIFFERENCE LEVELS

DIFFERENCE LEVEL	<u>TRAINING</u>	<u>CHECKING</u>	<u>CURRENCY</u>
A	SELF INSTRUCTION	NOT APPLICABLE (OR INTEGRATED WITH NEXT PC)	NOT APPLICABLE
B	AIDED INSTRUCTION	TASK OR SYSTEM CHECK	SELF REVIEW
C	SYSTEMS DEVICES	PARTIAL CHECK USING DEVICE	DESIGNATED SYSTEM
D	MANEUVER DEVICES -----	FULL PC USING DEVICE * -----	DESIGNATED MANEUVER -----
E	SIMULATOR C/D OR AIRCRAFT #	FULL PC USING SIMULATOR C/D OR AIRCRAFT *	PER FARs (TAKEOFFS & LANDINGS IN SIMULATOR C/D OR THE AIRCRAFT)

AT LEVEL E - FAA TYPE RATING IS ASSIGNED

* - IOE IS REQUIRED

PC . PROFICIENCY CHECK

FIGURE 6-3

6.5 Difference Training Levels.

6.5.1 Level A Training. Level A difference training is that training applicable to functionally equivalent aircraft which can adequately be addressed through self instruction by a crewmember. Level A training represents a knowledge requirement such that, once appropriate information is provided, understanding and compliance can be assumed to take place. Level A compliance typically is achieved by methods such as issuance of operating manual page revisions, dissemination of flight crew operating bulletins or differences handouts to describe minor differences in aircraft. Level A training is limited to situations such as the following:

a. The change introduces a different version of a system/component for which the flight crew has already shown the ability to understand and use (e.g., an updated version of an engine).

b. The change results in minor or no procedural changes and does not result in adverse safety effects if the information is not reviewed or is forgotten (e.g., a different vibration damping engine mount is installed... expect more vibration in descent; logo lights are installed... use is optional).

c. Information that highlights a difference which once called to the attention of a crew is self-evident, inherently obvious, and easily accommodated (e.g., different location of a communication radio panel, a different exhaust gas temperature limit which is placarded, or changes to non-normal "read and do" procedures).

6.5.2 Level B Training. Level B difference training is that training applicable to functionally similar aircraft which can adequately be addressed through aided instruction of a crewmember. At level B aided instruction is appropriate to ensure crew understanding, emphasize issues, provide a standardized method of presentation of material, or to aid retention of material following training. Level B aided instruction typically employs means such as slide/tape presentations, computer based tutorial instruction, use of stand-up instructors, or video tapes. Situations not covered under the provisions of level A, shown by 6.5.1 items a through c, above require level B (or higher levels if certain tests described later are failed).

6.5.3 Level C Training. Level C differences training is that training which can only be accomplished with devices which are capable of systems training. Level C differences training is applicable to variants having "part task" differences which affect skills or abilities as well as knowledge. Training objectives focus on mastering individual systems,

5/13/91

procedures, or tasks, as opposed to performing highly integrated flight operations and maneuvers in "real time." Level C may require self instruction or aided instruction of a crewmember, but cannot be adequately addressed by a knowledge requirement alone. Training devices are required to ensure attainment or retention of crew skills and abilities to accomplish the more complex tasks, usually related to operation of particular aircraft systems. At level C systems knowledge or skills relate to specific tasks rather than fully integrated tasks. At level C performance of steps to accomplish normal, non-normal, alternate, recall procedures, or maneuvers related to particular systems (flight guidance control systems/flight management systems) may, however, be necessary. Typically, level C requires use of cockpit systems simulators, cockpit procedure trainers, part task trainers (e.g., inertial navigation system (INS), flight management system (FMS), or traffic collision avoidance system (TCAS) trainers or similar devices. At the high end of level C, devices may approach fixed base simulators in terms of complexity. Flight training devices level 2 through 5 are typically acceptable for level C differences training. Flight training devices level 6 or 7 or any simulator can also satisfy differences training level C requirements provided that device or simulator can accomplish the training objectives.

6.5.4 Level D Training. Level D training is training which can only be accomplished with devices capable of performing flight maneuvers and addressing full task differences affecting knowledge, skills, and/or abilities. "Flight maneuver" capable devices address full task performance in a dynamic "real time" environment. Such devices permit integration of knowledge, skills, and abilities in a simulated flight environment, involving combinations of operationally oriented tasks and realistic task loading for each relevant phase of flight. At level D knowledge and skills to complete necessary normal, non-normal, alternate, or recall procedures are fully addressed for each variant. Crews can adequately accomplish each relevant task except those which specifically require a "high fidelity" environment such as provided by motion or visual cues to properly accomplish a task or maneuver. Level D training requires mastery of interrelated skills which cannot be adequately addressed by separate acquisition of a series of knowledge areas or skills that are interrelated. At level D, use of a series of separate devices for systems training would not suffice if demonstrating interrelationships between the systems is important. Level D training devices have correct integration of systems and controls and realistic instrument indications, but factors such as visual cues, motion cues, dynamics, control loading or environmental conditions may be simplified or absent. Weather phenomenon such as low visibility, Cat III, or wind shear may not be incorporated. Where simplified or generic characteristics of a type are used in difference training level D devices, significant negative training must not occur as a

5/13/91

AC 120- 53
Appendix 1

result of the simplification. At the upper end of differences training level D, acceptable devices may approach C/D simulator characteristics including actual handling characteristics, full equations of motion, control loading, and other factors, but may not necessarily have motion or visual cues or accurate environmental modeling. Devices typically acceptable for training level D include those devices where relevant elements of aircraft flight maneuvering, performance, and handling qualities are incorporated, even though in a simplified or generic fashion, such as fixed base non-visual simulation, and fixed base visual simulation. Accordingly, devices acceptable for level D training include those which meet FAA criteria for:

- a. training device level 6 or level 7, or
- b. simulators A or B (formerly called visual or phase I simulators).

6.5.5 Level E Training. Level E is training applicable to aircraft having "full task" differences which also requires a "high fidelity" environment to attain or maintain knowledge, skills, or abilities. The term "high fidelity" in this context relates to devices that throughout the applicable flight envelope comprehensively and accurately model at least the following:

- a. systems, controls, indications, performance and dynamics;
- b. motion, visual, and audio cues;
- c. environmental, and other relevant external factors.

Level E provides a realistic and operationally oriented flight environment achieved only by use of C or D simulators (formerly phase II or phase III simulators) or the aircraft itself. Level E training in an aircraft, however, may be restricted for safety reasons regarding maneuvers which introduce a high degree of risk in attempting to simulate non-normal configurations or adverse environmental conditions. As with other levels, when level E training is assigned, suitable credit or constraints may be applied for knowledge, skills, and/or abilities related to other pertinent variants. Credits or constraints are specified for the subjects, procedures, or maneuvers shown in FSB reports and are applied through ODR tables. When level E training differences are designated for one or more variants, the FAA tracks pilot-in-command (PIC) certification separately in the form of a different pilot type rating. Level E training is required for any variant considered significantly different from a base aircraft. The assignment of difference training level E and an additional type rating generally correlates with significant differences in handling qualities.

5/13/91

In certain instances, major systems differences could lead to assignment of level E if high fidelity simulation (simulator C or D) is required to achieve training objectives.

6.6 Difference Checking Levels.

6.6.1 Initial and Recurrent Checking in General. Differences checking addresses any pertinent airmen testing or certification including type rating checks, proficiency checks, AQP evaluations, and any other checks specified by FSB reports. Initial and recurrent checking levels are the same unless otherwise specified by the FSB. In certain instances it may be possible to satisfactorily accomplish recurrent checking objectives in devices which do not meet initial checking requirements. In such instances and if approved by the FSB and the POI, certain devices not meeting initial check requirements may be approved for use for recurring checks. However, the FAA may require checking in the initial level device when doubt exists regarding airman competency or program adequacy. In addition to type rating, proficiency checks, AQP evaluations, and other checks, initial operating experience (IOE) may be required in conjunction with certain difference checking levels. section 6.6.7 addresses initial operating experience which is to be completed following checking. For AQP programs, differences checks may be addressed by or included in other specified evaluations.

6.6.2 Level A checking. Level A checking denotes that a check related to differences is not required at the time of differences training. However, a crewmember is responsible for knowledge of each variant flown, and differences items may (or should) be included as an integral part of subsequent recurring proficiency checks.

6.6.3 Level B checking. Level B checking denotes a "task" or "systems" check is required for initial and recurring differences training. Level B checking typically applies to particular tasks or systems such as INS, FMS, TCAS, or other individual system or related groups of systems.

6.6.4 Level C checking. Level C checking denotes that a check using a level C device is required for initial and recurring differences training. The partial check is conducted relative to particular maneuvers or systems designated by the FSB. Level C requires a check performed using a "dynamic" flight environment, and is done using devices required or permitted by level C training or higher. An example of a level C check would be evaluation of a sequence of maneuvers demonstrating a pilot's ability to use a flight guidance control system or flight management system. An acceptable scenario would include each relevant phase of flight but would not necessarily address maneuvers that do not relate to set up or

5/13/91

AC 120-53
Appendix 1

use of the FGCS or FMS.

6.6.5 Level D Checking. Level D checking denotes that a full proficiency check (PC) is required for each variant following both initial and recurrent training. However, in conducting the proficiency checks, maneuvers common to each variant may be credited and need not be repeated. The proficiency check is conducted in accordance with particular maneuvers, systems, or devices designated by the FSB. Level D checks are performed using scenarios representing a "real time" flight environment and use devices permitted for level D or higher differences training. Level D checks may be administered in devices approved for related level D training and may be limited by the capabilities of that device. Typical level D checks include at least a full proficiency check in one variant and a partial PC in the other variant (e.g., 1 1/2 PC's at each normally scheduled PC). The partial PC covers all pertinent maneuvers except those common to both variants. The equivalent of two proficiency checks are completed considering any credit for common maneuvers. PC maneuvers typically are completed in the differences level D device for one of the variants and in a C/D simulator (phase II/III simulator) for the other variant. Proficiency training may alternately be substituted for proficiency checks as permitted by FAR 121, but when such training is substituted, appropriate training must be completed for each variant. Maneuvers from Part 121, Appendix F or AQP flight qualification events apply except where limited by the capabilities of a differences level D device.

6.6.6 Level E Checking. Level E checking denotes that a full proficiency check is conducted in a C or D simulator or aircraft, for each variant, and for both initial and recurrent differences training. Alternating checks in accordance with section 121.441 are permitted. Either training or checking in each level E variant is required each 6 months unless alternating checks are accomplished each 6 months as is required for flying two separate and unrelated types. Credit for maneuvers common to level E variants may be permitted, but level E devices must be used for each variant for specified maneuvers. Proficiency checks or AQP evaluations are conducted in accordance with particular maneuvers, systems, or devices designated by the FSB. Level E checks are performed consistent with ATP and Type Rating Practical Test Standard or Order 8400.10 criteria using at least a simulator C or D (phase II/III) or an aircraft. When level E is assigned as a result of a level determination test process, suitable credit may be applied for knowledge, skills, and/or abilities common to checks on pertinent level E variants. Common knowledge, skills, and/or abilities for variants are reflected in checking requirements through procedure or maneuver credits defined by the FSB and by credits or limitations on devices used for checks. When level E is assigned to a variant, the POI,

the NSET, and if necessary the FSB, determine allowable credit for checks in other variant's C and D simulators, defines any procedure and maneuver credits or limitations for parts of checks given in differences level C or D devices used in conjunction with the level E simulators or aircraft, and specifies any necessary credits or limitations for initial operating experience, line orientated flight training, or line orientated simulation pertinent to each variant. Assignment of level E checking requirements alone or in conjunction with level E currency does not result in assignment of a separate type rating by the FAA.

6.6.7 Initial Operating Experience (IOE) for Variants.

6.6.7.1 Application of IOE to Variants. Requirements for IOE are consistent with provisions for IOE specified under Part 121 and for AQP online evaluations. However, applicability of IOE to certain variants is clarified based on the significance of various difference levels. Accordingly, limitations on IOE may be specified, credit for IOE in similar variants may be permitted, particular types of IOE may be specified when necessary, and completion of IOE using simulators may be permitted in certain instances for variants. While IOE is completed for a particular type in accordance with FAR 121.434, additional IOE beyond that required for a particular type may be needed to address variants. Portions or all of such additional IOE may be completed in simulation when so designated by the FSB. Application of IOE or AQP online evaluations for variants is specified in FSB reports and MDR's in conjunction with difference checking levels.

6.6.7.2 Supervised Line Flying (SLF). Supervised line flying is a form of IOE which may be specified in certain circumstances. SLF is a specific type of IOE in which a pilot occupies a specific crew position and performs particular assigned duties related to postqualification skill enhancement while under supervision. Supervision is by an airman qualified to conduct the SLF and is typically a check airman. SLF is not accomplished by observation from a jumpseat. SLF is not accomplished until after a crewmember is trained and, if applicable, checked to perform duties for that particular crew position. In some instances, IOE must be conducted as supervised line flying and is so identified when MCR's and ODR's are approved.

6.6.7.3 Purposes for IOE/SLF. There are a variety of reasons why the FSB and principal inspectors specify IOE or SLF in conjunction with master difference requirements. One or more of the reasons described below may apply:

5/13/91

AC 120-53
Appendix 1

- a. Introduction of new aircraft types or variants;
- b. Introduction of new systems (e.g., PMS, TCAS, Omega, INS);
- c. Introduction of new operations (e.g., oceanic operations);
- d. Experience for a particular crew position (e.g., PIC, SIC, F/E);
- e. Postqualification skill refinement (e.g., refining alternate or multiple ways to use particular equipment to increase operating efficiency, operating flexibility, or convenience);
- f. Special characteristics (e.g., unique airports, mountainous areas, unusual weather, special air traffic control procedures, non-standard runway surfaces, etc.).

6.6.7.4 IOE/SLF Credits or Constraints. IOE or SLF may be specified for variants in conjunction with any difference checking level and may be tailored to specific difference level objectives. Credit for common systems, procedures, or maneuvers with other variants is permitted. Credit toward IOE/SLF may also be permitted for certain LOFT experience. At difference checking levels A through D, IOE time requirements described in Part 121 do not apply. Simplified or reduced time IOE/SLF may be administered and constrained only by FSB requirements. IOE or SLF is required and is specified at levels D and E by the FSB in MDR's. IOE must meet Part 121.434 requirements at level E, except that credit for applicable IOE in other variants may be permitted by the FSB. When approved by the FAA, IOE/SLF related to differences may be accomplished as part of or in conjunction with AQP online evaluations or LOS.

6.7 Difference Currency Levels.

6.7.1. The terms "Currency" and "Recency of Experience." The term currency as used in this AC addresses recent experience necessary for safe operation of aircraft types or variants as designated by the FSB. When addressing flight experience required by section 121.439, currency is considered to have the same meaning as recency of experience.

6.7.2 Level A Currency. Level A currency is currency which is considered to be common to each variant. Thus, assessment or tracking of currency for separate variants is not necessary or applicable. Maintenance of currency at level A in any one variant or a combination of variants suffices for any other variant.

6.7.3 Level B Currency. Level B currency is "knowledge related" currency achieved through self-review by an individual crewmember for a particular variant. Self-review typically is accomplished by review of material provided by the operator to crewmembers for that purpose. Self-review may be accomplished at an individual crewmember's initiative, but the operator must identify the material and the frequency or other situations in which the material should be reviewed. Self-review may be based on manual information, bulletins, aircraft placards, memos, class handouts, video tapes, or other memory aids that describe the differences, procedures, maneuvers, or limits for pertinent variant(s) that crews are flying. An example of acceptable compliance with level B currency would be issuance of a bulletin which directs crews to review specific operating manual information before flying a variant if that variant has not been flown within a specified period (e.g., fly that variant or have completed a review of the differences in limitations and procedures within the past 90 days). Another method of compliance would be crew certification on a dispatch release that they have reviewed pertinent information for a particular variant to be flown on that trip. Level B currency cannot, however, be achieved solely by review of class notes taken by and at the initiative of an individual crewmember unless the adequacy of those notes is verified by the operator.

6.7.4 Level C Currency. Level C currency is currency related to one or more designated systems or procedures. Level C currency relates to skill as well as knowledge requirements. An example would be establishment of INS currency, FMS currency, flight guidance control system currency, or other particular currency that is necessary for safe operation of a variant. An example of application of level C for a variant with a flight management system (FMS) would require that a crewmember fly that variant within the specified period or reestablish currency. Currency constraints for level C typically are 90 days. However, some systems or procedures may require shorter time limits while others may be longer than the 6 or 12 month interval for PIC or SIC proficiency checks if the pertinent items are not always addressed by these checks. When level C currency applies, any pertinent lower level currency also is addressed. Examples of methods acceptable for addressing level C currency are:

- a. Crew scheduling practices which result in a crewmember being scheduled to fly a variant with the pertinent system/procedure within the specified period;
- b. Tracking of an individual crewmember's flying of variants which have the particular system/procedure within the specified period;
- c. Use of a higher level method (level D or E currency); or

5/13/91

AC 120- 53
Appendix 1

d. Other methods as designated or found acceptable by the FSB.

6.7.5 Reestablishing Level C Currency. When currency is lost, currency may be reestablished by completing required items using a device equal to or higher than that specified for level C differences training and checking. Other means to reestablish currency include flight with an appropriately qualified check airman, completion of proficiency training, or a proficiency check. In some instances, a formal refamiliarization period in the actual aircraft with the applicable system operating while on the ground may be acceptable if permitted by the FSB. Such refamiliarization periods are completed using an operator established procedure under the supervision of an airman designated by the operator. In the case of a non-current SIC or FE, a designated PIC may be authorized to accompany a SIC or FE to reestablish currency.

6.7.6 Level D Currency. Level D currency is currency related to designated maneuvers. Maneuver currency addresses knowledge and skills required for performing aircraft control tasks in real time with integrated use of associated systems and procedures. Level D currency may also address certain differences in flight characteristics. Maneuvers specified by the FSB for level D usually are associated with Part 61 Appendix A, Part 121 Appendix F, or AQP flight qualification event requirements. However, level D currency may apply to performance of any maneuvers including related normal, non-normal, alternate, or recall procedures for a particular variant. When level D is necessary, lower level currency is also addressed. A typical application of level D currency is to specify selected maneuvers such as a takeoff, departure, arrival, approach, or landing which are to be performed using a particular Flight Guidance Control System (FGCS) and instrument display system. Either a crewmember must fly a variant equipped with the FGCS and particular display system sufficiently often to retain familiarity and competence within the specified currency period, or currency must be re-established. Level D currency limits for a particular variant are typically set at 90 days for normal maneuvers and procedures. Examples of methods acceptable for addressing level D currency are:

a. Tracking of flights by a particular crewmember in a particular variant to assure experience within the specified currency period;

b. Tracking of completion of specific maneuvers based on logbook entries, Airline Communication & Reporting System (ACARS) data, or other reliable records to assure experience within the specified currency period;

5/13/91

c. Scheduling of aircraft or crews to permit currency requirements to be met with verification that each crewmember has actually accomplished the assigned or an equivalent schedule;

d. Completion of airmen certification, proficiency check, proficiency training, AQP evaluations, or other pertinent events in which designated maneuvers are performed in a device or simulator acceptable for level D currency;

e. Use of a higher level method (level E currency); or

f. Other methods as designated or found acceptable by the FSB.

6.7.7 Reestablishing Level D currency. When currency is lost, currency may be reestablished by completing pertinent maneuvers using a device equal to or higher than that specified for level D differences training and checking. Other means to reestablish currency include flight with an appropriately qualified check airman during training or in line operations, completion of proficiency training, a proficiency check, or AQP proficiency evaluation.

6.7.8 Level E Currency. Level E currency is currency which requires separate experience in a variant to meet section 121.439 requirements for completion of three takeoffs and landings in the previous 90 days or the equivalent AQP recency of experience. Level E currency may also specify other system, procedure, or maneuver currency item(s) necessary for safe operations, as identified by the FSB. Level E currency generally requires takeoffs, landings, procedures, or maneuvers to be accomplished in a C/D simulator for that variant or the aircraft. It is recognized that Section 121.439 directly addresses takeoffs and landings only, and for certain aircraft takeoffs and landings may not necessarily assure currency for particular systems or other maneuvers. However, FSB provisions related to takeoff and landing are applied in a way which addresses needed system or maneuver experience. For example, if FGCS, FMS, EFIS, navigation, or other system or maneuver experience is the basis for a currency requirement, approval of an operator's program at level E includes use of those systems in conjunction with satisfying Section 121.439 takeoff and landing requirements. In such an instance making three simulator takeoffs and landings in VFR closed traffic without using the FGCS, EFIS, or FMS may not be sufficient to meet level E currency requirements. When level E is assigned to a variant(s) but flight characteristics are common, Section 121.439 credit may be permitted for takeoffs and landings in any variant which has common flight characteristics. In such instances pertinent currency requirements for knowledge, skills, procedures, or other maneuvers may be necessary as defined by the FSB. When common takeoff and landing

5/13/91

AC 120-53
Appendix 1

credit is permitted, the FSB also determines any credit or constraints applicable to using C/D simulators for other variants. Assignment of level E currency requirements do not result in assignment of a separate type rating by the FAA. Only assignment of level E training relates to the designation of type ratings. Level E currency applicable to each variant must be tracked by a means the same as or equivalent to those means acceptable for tracking currency under Section 121.439.

6.7.9 Reestablishing Level E currency. When currency is lost, currency may be reestablished by completing pertinent maneuvers using a device specified for level E differences training and checking. Other means to reestablish currency include flight with an appropriately qualified check airman during training or in line operations, completion of proficiency training, a proficiency check, or AQP evaluation.

6.7.10 Competency Regarding Alternate and Non-Normal Procedures. Competency for non-normal maneuvers or procedures is generally addressed by checking requirements. However in certain instances, particular alternate/non-normal maneuvers or procedures may not be mandatory for checking or training. In this situation, it may be necessary to periodically practice or demonstrate those maneuvers or procedures even though it is not necessary to complete them during each check. In such instances, the FSB may specify a currency requirement for training or checking applicable to alternate/non-normal maneuvers or procedures that are to be performed. This is to assure that extended periods of time do not elapse in a series of repeated training and checking events in which significant maneuvers or procedures may never be accomplished. Thus, when an alternate/non-normal maneuver or procedure is not mandatory and is not accomplished during each proficiency training (PT) or proficiency check (PC), but is still important to be occasionally practiced or demonstrated, the FSB may establish a currency requirement. When designated, these currency requirements identify each alternate/non-normal maneuver or procedure, the currency level applicable, and a time period which applies (e.g., within 36 months) or any other necessary constraints (e.g., within the previous three PT or PC events).

6.8 Operator Difference Requirements (ODR's).

6.8.1 ODR Purpose. Operator difference requirements are a formal description of differences between variants flown by a particular operator with a corresponding list of FAR compliance methods pertinent to training, checking, and currency. ODR tables provide a uniform means for operators to comprehensively assess, describe, and manage difference programs, show compliance methods associated with Part 121 Subparts N and O or the AQP SFAR, obtain FAA approval, and make revision to programs when changes are

needed. ODR's provide a basis for FAA approval of differences programs related to mixed fleet flying of variants. ODR's are prepared and applied by each operator conducting mixed fleet flying if MCR's are established by FAA, and if differences exist within an operator's fleet which affect crew knowledge, skills, or abilities pertinent to flight safety. ODR's permit operator specific assessment and approval of unique variant configurations and use of different combinations of variants, while ensuring that a common FAA safety standard is met. ODR's also permit credits, apply constraints, and identify precautions for transition programs between variants. ODR's provide a standardized means for FAA to review, approve, and periodically assess individual operators differences programs. ODR's have other applications such as in the identification of example differences and compliance methods necessary for difference level test formulation and original preparation of MDR's when new variants are type certificated.

6.8.2 ODR Content. ODR's identify a base aircraft, describe differences between variants, and show an operator's methods of compliance with FAA requirements. ODR's are approved by FAA initially and for each revision.

a. Base aircraft. ODR's identify one variant or variant group within an operator's fleet as a base aircraft. The base aircraft serves as a reference for comparison with other variants or variant groups. Selection criteria and characteristics of base aircraft are described in sections 8.4 and 9.4.

b. Variants. ODR's identify particular variants flown by an operator within each fleet. The characteristics and combinations of variants selected may be operator and fleet specific. ODR's consider only those variants and combinations of variants actually flown by that operator. ODR's are not constrained by characteristics of variants that are not flown by that operator.

c. Differences. ODR's describe differences within each fleet between variants or variant groups (e.g., differences between DC9-31, DC9-50, and MD-82 variants are identified for a combined DC9/MD80 fleet, considering a DC9-50 as the base aircraft). Differences from the base aircraft are described by comparing the base aircraft to each variant or variant group directly, or by comparing the base aircraft to one variant, and that variant to other variants in sequence, until each variant is addressed.

d. Significance of Differences. Differences are described in summary form and are categorized by differences in design features, systems, and maneuvers. Differences are evaluated relative to their effect on either flight characteristics and/or procedures. Flight characteristics includes both handling qualities and performance. Procedures consider normal, non-

5/13/91

AC 120- 53
Appendix 1

normal, alternate, and recall items. Limitations are considered in conjunction with normal procedures.

e. Compliance methods. ODR's show how each operator's program addresses differences, through description of training methods, checking methods, or currency methods for each fleet (e.g., ODR's for B737 fleet, ODR's for DC10 fleet,...). ODR's describe the specific or unique constraints or credits applicable, and any precautions necessary to address differences between variants. Operator difference requirements (ODR's) must comply with and be as restrictive or more restrictive but not less restrictive than FAA master difference requirements (MDR's) and other FSB provisions. Constraints or credits may be applied to all variants in a fleet or only to certain variants. Constraints or credits may address training methods, devices, simulators, checking methods, and currency methods, knowledge, skills, procedure maneuvers, "seat specific" or "crew position specific" factors, or any other factors which apply to or are necessary for safe operations. Training, checking, and currency compliance methods are proposed and revised by each operator consistent with ODR examples from a variety of sources which have been found acceptable to FAA. ODR examples are found in FSB reports, previously approved ODR tables for other operators or fleets, approved ODR tables for similar aircraft types, and manufacturer or STC modifier examples prepared during type certification.

6.8.3 Standard ODR Format. ODR's are depicted in tables in summarized form, using a standardized written or computer format. If necessary, any explanation of details about differences, constraints and credits, precautions or compliance methods are included in attachments or appendices to ODR tables or are cross referenced to other operator documents.

Figure 6-4 shows the general format for operator difference requirements (ODR) Tables. Examples of design feature differences, systems differences, and maneuver differences have been depicted for ODR tables applicable to a B747-200 to B747-400 program. The far left column lists design, system, or maneuver differences which are pertinent. The "Remarks" column summarizes specific areas or items of difference. The "Flight Characteristics" and "Procedural Change" columns identify what (if any) difference effects are noted. The compliance methods section of the table notes the particular operator's approved means of compliance with FAA master difference requirements (MDR) provisions.

In figure 6-4 the following abbreviations were used in the particular B-747 ODR examples shown:

AVT = Audio Visual Training

Appendix 1

FBS	=	Fixed Base Simulator
FFS	=	Full Flight Simulator
CBT	=	Computer Based Training
ACFT	=	Aircraft
EICAS	=	Engine Indicating and Crew Alerting System
FMS	=	Flight Management System
AFDS	=	Auto Flight Display System
EFIS	=	Electronic Flight Instrument System
FMC	=	Flight Management Computer

OPERATOR DIFFERENCE REQUIREMENTS TABLES (ODR TABLE EXAMPLES)

DESIGN FEATURE DIFFERENCES

DIFFERENCE AIRCRAFT: 747-400 BASE AIRCRAFT: 747-200 APPROVED BY (POI)				COMPLIANCE METHOD						
				TRAINING					CHKG/CURR	
	REMARKS	PLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	LVL D	LVL E	FLT CHK	CURR
FLIGHT DECK INTERNAL GEOMETRY	DELETION OF FLIGHT ENGINEER STATION REQUIRES TRAINING IN 2-CREW COCKPIT MANAGEMENT TECHNIQUES	NO	YES SEE APP.A NOTE 1		AVT	FBS	FBS		D	D 90 DAYS
PANEL LAYOUT	COMPLETE REVISION				AVT	FBS	FBS		D	D 90

SYSTEMS DIFFERENCES

21 AIR CONDITIONING AND PRESSURIZATION	<ul style="list-style-type: none"> AUTOMATED CONTROLS EICAS DISPLAY/MESSAGES FMS PRESS. CONTROL SYS ARCHITECTURE DIFFERENT DUAL DIGITAL CONTROLLERS W/ AUTO BACK-UP F/A PAX CABIN ZONE CONTROL PAX CABIN 75° BACKUP MODE 	NO	YES SEE APP.A NOTE 2		AVT	FBS				
22 AUTOFLIGHT	<ul style="list-style-type: none"> AFDS W/ AUTOLAND AUTO THROTTLE EICAS DISPLAY/MESSAGES EFIS FLT MODE ANNUNCIATION 	NO	YES SEE APP.A NOTE 3		AVT	FBS		FFS OR ACFT	E	D 90 DAYS
49 APU	AUTOMATED CONTROL	NO	YES		AVT	FBS				

MANEUVER DIFFERENCES

ILS AND OTHER INSTRUMENT APPROACHES	• USE OF AFDS, FMC, AND AUTOTHROTTLE	NO	YES SEE APP.A NOTE 22		AVT+ CBT	FBS		FFS OR ACFT	E	D 90 DAYS
LANDING AND AUTOMATIC LANDING	• USE OF AFDS, FMC, AND AUTOTHROTTLE	NO	YES SEE APP. A NOTES 22&23		AVT+ CBT	FBS		FFS OR ACFT	E	D 90 DAYS
REJECTED LANDING	• USE OF AFDS, FMC, AND AUTOTHROTTLE	NO	YES		AVT+ CBT	FBS		FFS OR ACFT	E	

FIGURE 6-4

6.8.4 ODR Approval, Distribution, and Availability. ODR's are approved for each fleet by an operator's FAA principal operations inspector (POI). In accordance with FSB report provisions, ODR's must be prepared, reviewed, and approved prior to Part 121 operations. Approved ODR's are retained by the operator with a duplicate copy as part of FAA certificate holding district office (CHDO) records. AEG's receive copies of or have computer access to each approved ODR to manage FSB programs for new types or variants, ensure standardization, and revise MDR's and FSB reports when necessary. While ODR's are operator unique, information contained in ODR tables is considered to be part of FAA records for that operator and is available to the public in accordance with FAA policies. However, information referenced by ODR's which is not contained in the ODR table itself, if so identified by an operator, may be proprietary information of that operator (e.g., company manuals, contractual specifications, etc.). While FAA has access to this information, public availability may be controlled by that operator.

6.8.5 ODR Revision. ODR tables are revised by operators and reapproved by FAA when fleet characteristics change or when compliance methods change. A fleet characteristics change includes modification or redesignation of base aircraft, addition of variants, change of variants, modification of variants, or phaseout of variants. Changes in compliance methods refer to introduction of new or different training methods, contracting for use of different devices or simulators, revision of checking or currency methods, or other such changes. Revisions to ODR's are also prepared, reviewed, and approved prior to Part 121 operations.

6.8.6 Section 8 of this attachment describes the development, approval, and application of ODR tables to individual operator programs. Section 9 describes FAA review and approval of programs by principal inspectors.

5/13/91

AC 120- 53
Appendix 1

7. FORMULATION OF FSB REPORTS, MASTER COMMON REQUIREMENTS (MCR's), MASTER DIFFERENCE REQUIREMENTS (MDR's), AND DESIGNATION OF TYPE RATINGS.

7.1 Requirements Formulation Process Overview.

The process for FAA formulation and revision of training, checking, currency, and type rating requirements for new, derivative, or extensively modified aircraft is shown in figure 7-1.

5/13/91

MASTER REQUIREMENTS FORMULATION (AN FAA/MANUFACTURER/OPERATOR PROCESS)

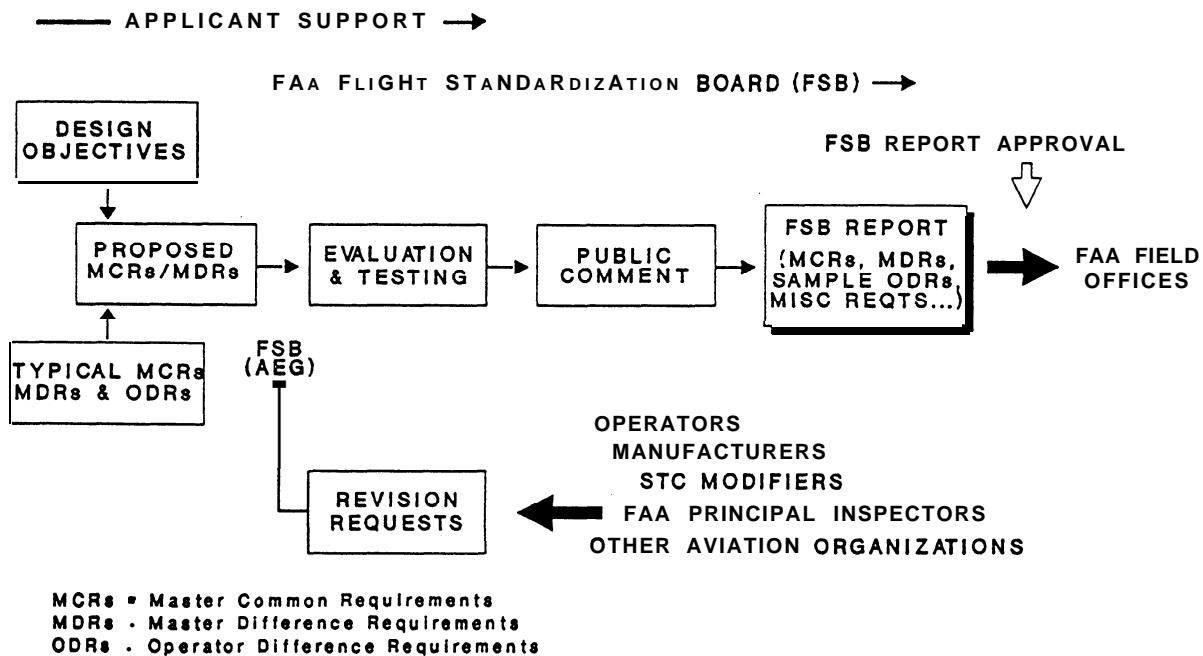


FIGURE 7-1

5/13/91

AC 120-53
Appendix 1

7.1.1 The process determines which information is required for a type or variant, includes a proposal for requirements, tests and evaluates the proposed requirements, solicits public comment, finalizes the requirements, and applies and implements the FSB requirements. Manufacturers or modifiers propose MCR's, MDR's, examples of ODR's, and any other related FSB provisions necessary. Proposals for requirements are based on design objectives, analysis, evaluation of operating experience, other programs that have been previously shown to be acceptable to FAA, or other methods. Setting of requirements is based on an objective set of tests and standards, analysis of results, and FAA judgments considering operating experience and public comment. Standardized tests are prepared and conducted by the applicant and FAA. Test support is provided by the applicant, and evaluation is conducted by the FAA FSB. Results are evaluated by the FSB in conjunction with the applicant, and proposed minimum requirements are formulated by FAA. Public comments on the proposals are solicited. Final requirements are then set by the FSB by specifying MCR's, MDR's, and other FSB provisions. Findings are described in an FSB report which is disseminated to FAA field offices for application to specific operator programs. The process of formulation and application of FSB requirements starts at the time a new aircraft or derivative is proposed to the FAA and continues throughout the fleet life of that aircraft or variant. For aircraft already in service the process may be initiated when significant modifications are proposed, when requested by operators, or when mixed fleet flying takes place with variants. Periodic revisions of requirements are addressed as the need is identified by FAA. Revisions are initiated either by FAA, operators, manufacturers, modifiers, interest groups, or the public when requested.

7.2 Proposals for MDR's, MCR's, Example ODR's, and Special Requirements.

7.2.1 When Proposals are Necessary. The FAA determines which information is needed for a type or variants and which requirements, including MCR's, MDR's, or other elements of FSB reports, are pertinent or necessary. This is usually determined in conjunction with type certification or supplemental type certification programs. When required, manufacturers or modifiers are advised by FAA of the information which is necessary. For new aircraft that do not yet have variants (original type certification), initial MCR's are formulated. For variants, MDR's and any necessary changes to existing MCR's are proposed. For new aircraft which also have variants being certificated at the same time, both MCR's and MDR's may be developed simultaneously. For certain types which are in limited use (e.g., Caravelle, DC-6, etc...), or which have few or no variants and have had successful operational experience under FAR 121, the FAA may elect not to develop MCR's, MDR's, and FSB reports. Air carrier programs using these aircraft are approved on a case by case basis.

7.2.2 Proposal Formulation. The requirement formulation process typically starts when a manufacturer proposes a new design or design modification. The manufacturer or modifier formulates necessary information for training, checking, and currency for the type or variant in proposals for MCR's, MDR's, example ODR's, and any other supporting information necessary for the FSB report. The applicant considers present and proposed variants, existing MCR's and MDR's, and existing or proposed ODR's. MCR's and MDR's for other similar aircraft, typical ODR tables that are already approved and used by operators, new types of proposed training devices, or other factors in addition to characteristics of the proposed aircraft itself may also be considered. To support development of a proposed MDR, the manufacturer prepares example ODR tables for pertinent variants. These examples represent proposals for programs for those specific variants and configurations which could be approved by FAA. Groups of variants within the type are then identified for the proposed MDR table. Any necessary tests are formulated to assess difference levels and associated training, checking, and currency requirements for incorporation in the MDR table. Interpretations of possible test results are identified, and agreement is reached between FAA and the applicant on specific tests, devices, and schedules to be used for the test program. Proposals for the following items are submitted to FAA, as necessary:

- a. master common requirements;
- b. master difference requirements;
- c. example operator difference requirements;
- d. tests and criteria to be used;
- e. other supporting information related to training, checking, or currency programs.

7.3 Difference Level Tests.

7.3.1 Standard Tests Used. A sequence of five standard tests described in attachment 4 is used to set MCR's, MDR's, acceptable training programs, other FSB provisions, and define type rating requirements. One or more of these five tests are applied depending on the type of certification, difference level sought, and the success of any previous tests used in identifying MCR's or MDR's. Only those tests needed are used to establish requirements. Type rating requirements, training, checking, and currency limits are established by the outcome of these tests and any resulting

5/13/91

AC 120-53
Appendix 1

difference levels that apply. If during this testing it is determined that the assignment of level E differences training is required for one or more variants, the FAA will establish an additional type rating. When a level E variant is first identified, the FAA assigns an additional pilot type rating to cover pertinent variants in that fleet of aircraft.

7.3.2 Steps in the Testing Process. The typical steps of the testing process are as follows:

- a. Representative training programs, difference programs, and necessary supporting information are developed as needed;
- b. Proposed MCR's, MDR's, and example ODR's are identified;
- c. The applicant and FAA determine which tests and criteria apply;
- d. The applicant and FAA determine which aircraft, variants, simulation devices, or analysis are needed to support testing;
- e. A proposal is made to the FAA, and agreement is reached on test procedures, schedules, and specific interpretation of possible results;
- f. Tests are conducted and results evaluated;
- g. FSB draft requirements are formulated.

7.3.3 Test Purpose and Application. A summary of the purpose and application of each of the five difference level tests is shown in figure 7-2.

TEST DEFINITIONS

	TEST PURPOSE	<u>APPLICATION</u>
T1	ESTABLISHES FUNCTIONAL EQUIVALENCE	SETS LEVELS, A/B, OR COMMON TYPE RATING
T2	HANDLING QUALITIES COMPARISON	FAIL REQUIRES E, & T5 ; PASS PERMITS T3, & C/D
T3	EVAL SYSTEMS DIFFS & SETS TRNG/CKNG REQTS	SETS LEVELS C OR D, (CRIT FAILURE SETS E)
T4	SETS OR REVISES CURRENCY REQUIREMENTS	USED TO ADJUST FSBs REQTS - IF NEEDED
T5	SETS TRAINING/CHECKING FOR NEW OR 'E' ACFT	SETS LEVEL E

FIGURE 7-2

5/13/91

AC 120-53
Appendix 1

7.3.4 Functional Equivalence - Test 1 (T1). Test 1 evaluates functional equivalence. T1 consists of a Part 61 or Part 121 pilot certification flight test administered in the comparison (variant) aircraft being tested and using a crew trained and experienced only in the base aircraft. Acceptable crew performance in the test, without differences training, establishes that the comparison and base aircraft are sufficiently alike to assign level A or level B. Test 1 is also used to determine if a common type rating may be designated for aircraft types which have separate type certificates. The distinction between assignment of level A and level B is based on analysis and results of the test with specific criteria described in attachment 4. Failure of T1 generally requires completion of T2 and T3.

7.3.5 Handling Qualities Comparison - Test 2 (T2). Test 2 is used to compare handling qualities between variants. T2 consists of selected Part 61 or Part 121 pilot certification flight check maneuvers administered in the comparison (variant) aircraft under test while using a crew trained and experienced only in the base aircraft. In T2, normal and non-normal flight maneuvers related to handling are performed using the aid of a safety pilot. However, the safety pilot may only aid in areas not related to evaluation of operationally relevant handling qualities. Acceptable crew performance in completion of designated maneuvers, without differences training, establishes that the variant and base aircraft are sufficiently alike in handling characteristics to permit assignment of level C or level D. Passing Test 2 permits a subsequent test (T3) assessing systems differences, training, and checking to be conducted. Failure of Test 2 indicates that major differences exist in handling characteristics during critical phases of flight (such as takeoff or landing) or that numerous less critical but still significant handling qualities differences exist between the base aircraft and variant. Accordingly, Test 2 failure requires the assignment of level E training. With level E, an aircraft or C/D simulator must be used to satisfy training and checking objectives. Also with level E training, a separate type rating is assigned to the fleet.

7.3.6 Systems Differences Test and Validation of Training and Checking - Test 3 (T3). Test 3 is a dual purpose test used to identify implications of systems differences on training and checking methods and devices, and at the same time validate training and checking methods and devices at level C or level D. T3 is administered in two phases following differences training of a crew in the comparison aircraft. The first phase is the completion of a pilot certification flight check to assess crew knowledge, skills, and abilities pertinent to operation of the variant being evaluated. The second phase is administered following completion of the flight check and is a simulated line oriented flying (LOF) test. The line oriented flying phase of the test is used to validate the training and

5/13/91

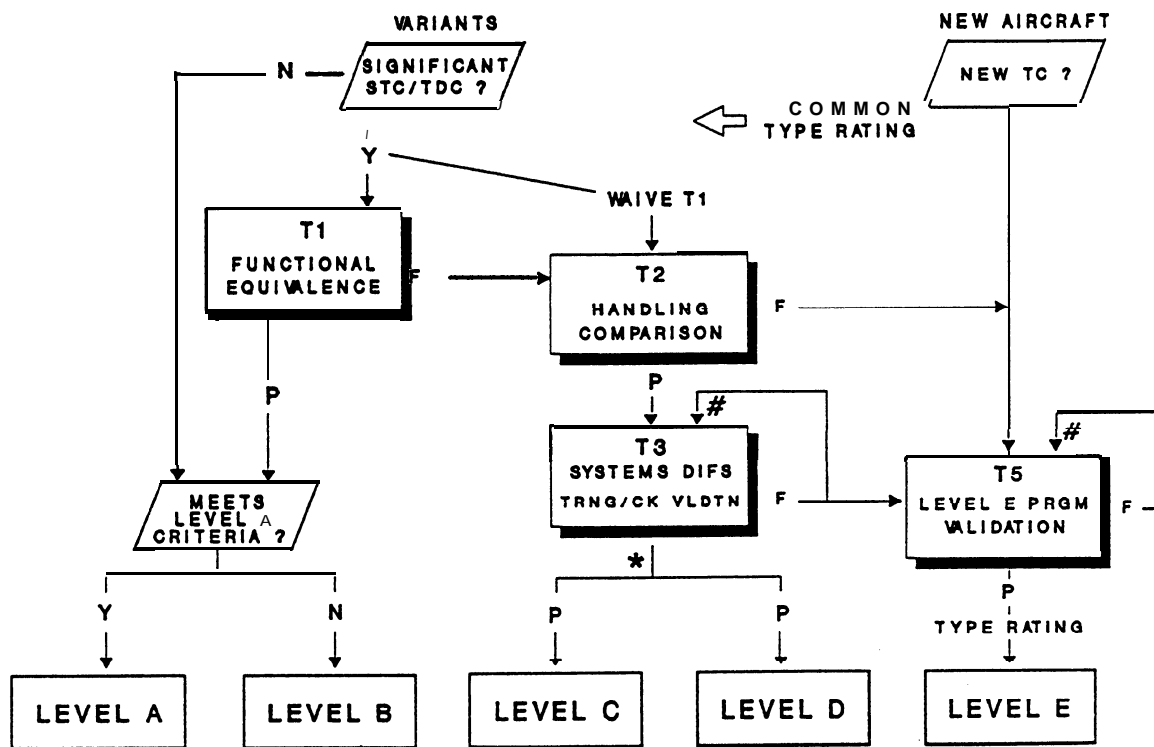
checking being proposed, as well as to fully assess particular difference areas, examine implications of mixed fleet flying, assess special circumstances such as MEL effects, and evaluate the effects of crew errors potentially related to the differences. The test is done in a realistic line flight environment that includes typical weather, routes, airports, **ATC**, and other factors which are characteristic of those that the aircraft will be operated in. **LOF** tests **may** be conducted in test aircraft, simulators, in conjunction with function and reliability certification tests, or with a combination of these. Passing **T3** leads to setting of respective difference levels at C or **D**. Failure of Test 3 may require increased programs within the proposed level or use of a higher level. In certain cases failure at D level may require the assignment of level E and a different type rating. In the event of repeated failures at level **D**, program requirements approaching full initial qualification levels, or where failures show that the high fidelity environment of C/D simulators **or the** aircraft is needed, level E may be assigned. In the event that level E is required, a separate type rating is assigned for the fleet .

7.3.7 Currency Validation - Test 4 (T4). Test 4 is a currency test that is used when operators seek relief from **FSB** designated currency requirements. This occurs when less restrictive currency requirements are requested by a manufacturer or operator. Basic currency requirements are set by the **FSB** based on Tests **1, 2, and 3** and are applied directly. Test 4 is used when a manufacturer or operator seeks relief from these conservative currency requirements and believes that other currency requirements may adequately provide for successful and safe operation of a particular aircraft or variant.

7.3.8 Initial or Transition Program Validation - Test 5 (T5). Test 5 is a validation **test** for training, checking, and currency requirements at level E similar to Test **3**. However, Test 5 is applicable to new aircraft types that do not have variants. **T5** is also applicable to derivative aircraft when level E is assigned as a result of **T2** or certain **T3** failures. Since aircraft evaluated **with T5 are assigned** level E and separate type ratings, Test 5 **may** credit applicable testing done during **T2** and **T3** in the event of **T2** or **T3** failures.

7.3.9 Test Relationships and Applications. The test process relationships, the sequence of conducting tests when more than one test is needed, and application of tests outcomes are shown in figure **7-3**.

TEST PROCESS AND SEQUENCE



KEY

- * • LEVEL AS PROPOSED BY APPLICANT
- # • PROGRAM REVISION REQD
- P • PASS F • FAIL
- Y • YES N • NO

FIGURE 7-3

The start of the process is shown at the top of figure 7-3. Resulting difference levels are at the bottom. New aircraft, for which an original type certificate is sought, follow the testing path at the right of the diagram for T5. At the end of the process the aircraft is assigned a new type rating. The process starts at the top center of figure 7-3 for variants. A series of decisions or tests leads to assignment of one or more levels A through D and in some instances may lead to level E. If level E is assigned as a result of this path, an additional type rating is assigned within that fleet. This process is followed whenever a new aircraft is proposed, when significant changes are proposed, or when revisions to existing requirements are needed as a result of requests for change or operating experience. In the diagram "P" denotes the passing of a test, and "F" denotes the failure of a test. "Y" and "N" denote yes and no answers to decision points regarding criteria rather than test outcomes.

7.3.10 Test Failures and Retesting. Generally, failures do not have paths back to lower levels. T3 failure at level C can lead to subsequent passage at C or D. Similarly, failure at level D can lead to either D or E, but not C. Failure at level E can only lead to retesting with increased programs, improved programs, or improved devices since there is no higher level. T5 failure paths do not lead back to level C or level D. However, subsequent new programs do not preclude making a proposal at a lower differences level if technology changes, aircraft redesign takes place, training methods significantly change, or device characteristics and effectiveness change.

7.3.11 Common Type Rating Tests. Aircraft proposed for a "common type rating" follow the path from the top right of figure 7-3 through T1 and T2 to the assignment of level A or B if successful. Common type ratings may not be initially approved at level C or level D. Thus, T3 is only applicable to evaluation of variants that already have a common type rating established and seek to retain the common rating when subsequent changes are proposed beyond level A or B. After demonstration of acceptable mixed fleet flying at level A or B, such aircraft may be considered for evaluation using T3 for assignment of level C or level D.

7.3.12 Currency Tests. Currency tests T4 are not shown in figure 7-3 because they are necessary only when operators, manufacturers, or modifiers seek relief from conservative currency requirements initially set by the FSB. When such relief is sought, information derived from T2 and T3 is used as a baseline and for comparison with performance following T4 to validate revised currency standards.

7.3.13 Detailed Test Specifications. A detailed specification for the evaluation process and tests to establish difference levels is described in

5/13/91

AC 120- 53
Appendix 1

attachment 4.

7.4 Flight Standardization Board Assessments and Proposal Formulation.

The FSB assesses the applicants proposals, test results, operating experience, analysis, and any other relevant factors in order to formulate an FAA proposal for MCR's, MDR's, and other pertinent training, checking, currency requirements to be included in an FSB report. The FSB proposal may also consider analysis of results or other relevant information provided by the applicant following testing. The FSB either validates the applicant's proposed MCR's, MDR's, training programs, and other information, or generates alternate requirements.

7.5 Public Comment.

7.5.1 Comment Solicited. The FSB proposal is circulated for FAA and public comment. Interested parties representing the manufacturer, operators, other pertinent FAA organizations such as engineering and flight test, pilots' associations, and other aviation representatives are invited to comment, provide relevant information, and make recommendations.

7.5.2 Public Meetings. For FSB initial determinations or major revisions a public meeting is held as part of the comment submission and review process. Public FSB meetings are usually held when initial FSB determinations and major changes address new, unique, controversial, or otherwise complex issues, and public discussion and comment can facilitate resolution of the issues. A public FSB meeting provides an opportunity for the FAA to directly review comments, concerns, recommendations, or factual information pertinent to an FSB prior to making any final determinations. A public meeting also provides various groups and the FAA an opportunity to directly exchange technical information in a timely manner and provide counter points that otherwise would be difficult to evaluate, interpret, or to apply. Proposed MCR's, MDR's, example ODR's, and other aspects of draft FSB reports are reviewed at the public meeting. Comments, concerns, or other information pertinent to the determination of the required difference levels is considered until the comment deadline. Comments received after the deadline are considered at the time of the next periodic FSB review unless an immediate safety problem is apparent.

7.5.3 Comment for Time Critical Revisions. Time critical FSB revisions to MCR's, MDR's, example ODR's, or other FSB provisions may be made on an emergency basis without prior public meeting or comment. However, comments may be solicited and considered subsequently. Appeal of such time critical FSB decisions is permitted and follows the same process shown in section 12.

7.6 FSB Final Determinations and Findings.

7.6.1 FSB Determinations. Following a public meeting any written comments submitted to FAA are reconciled, and final FSB determinations are made. Specification of MCR's, MDR's, example ODR's, acceptable training programs, and other FSB provisions are completed. Any necessary airman testing or currency provisions are identified. Assignment of any necessary type rating(s) is made.

7.6.2 Basis for FSB Judgments. FSB judgments are based on review of the applicant's supporting documentation, proposed ODR tables, test results, and any other pertinent information, such as FAA policies, operating experience, and results of other similar FSB evaluations. Specifically, FSB report provisions are based on or consider:

(a) Appropriate data, evaluation, or tests. Testing may include aircraft demonstration, simulation tests, device testing, or analysis;

(b) Direct experience. Where a substantial amount of industry experience exists with successful mixed fleet flying between particular variants, minimum difference level requirements may be formulated based on that operational experience. Further, comparisons may be drawn with similar aircraft variants that are already assigned difference levels. Experience with successful operational programs having particular devices, training, checking, or currency requirements may be used as a basis to set difference levels.

(c) Indirect experience. Applicable experience with foreign operators, military programs, or other programs that can establish the suitability of training, checking, or currency standards may be permitted as a means for FSB's to set MDR or ODR levels.

(d) Applicant, industry, and public comment. FSB requirements are set following solicitation and review of comments when necessary in a public FSB meeting.

7.6.3 Device or Simulator Characteristics. Minimum characteristics for devices or simulators for training, checking, or currency are noted using standard training device or simulator definitions. When standard criteria for methods, devices, or simulators are not appropriate for a type or variant, the FSB identifies suitable criteria to be applied and coordinates with the FAA National Simulator Evaluation Team. Standard devices and simulators applicable to each difference level are shown in figure 7-4.

STANDARD METHODS, DEVICES, AND SIMULATORS

(TYPICALLY ACCEPTABLE)

DIFFERENCE LEVEL	DIFFERENCE LEVEL DEFINITION	METHODS	DEVICES OR SIMULATORS ⁽¹⁾
A	SELF INSTRUCTION	BULLETINS MANUAL REVISIONS HANDOUT MATERIAL	- - -
B	AIDED INSTRUCTION	SLIDES/VIDEO TAPES STANDUP INSTRUCTION COMPUTER AIDED INSTRUCTION (TUTORIAL)	- - -
C	SYSTEMS DEVICES	- - -	TRAINING DEVICES LVL 2/3/4/5 FULL TASK COMPUTER BASED INSTRUCTION (CBI/CBT) (2)
D	MANEUVER DEVICES	- - -	TRAINING DEVICES LVL 6/7 SIMULATOR A OR B (3)
E	SIMULATOR. C/D OR AIRCRAFT (FULL FIDELITY ENVIRONMENT)	I - -	SIMULATOR C OR D AIRCRAFT (4)

FOOTNOTES

- (1) TRAINING LEVEL AND SIMULATOR DEFINITIONS ARE AS SPECIFIED BY SFAR 58 AND AC 120-45A
- (2) TRAINING DEVICE LEVELS 3/4/5 TYPICALLY INCLUDE COCKPIT PROCEDURE TRAINERS, COCKPIT SYSTEM SIMULATORS, AND SIMILAR DEVICES
- (3) TRAINING DEVICE 6/7 OR SIMULATOR A/B TYPICALLY INCLUDES FIXED BASE SIMULATORS, VISUAL SIMULATORS, OR PHASE I SIMULATORS
- (4) SIMULATOR C OR D INCLUDES PHASE II OR PHASE III SIMULATORS

FIGURE 7-4

7.7 FSB Report Preparation, Distribution, and FAA Application.

7.7.1 Report Preparation and Approval. After MCR's and MDR's are finalized, the FSB report is prepared. Sufficient background or explanatory material is provided in the report to permit FAA personnel to properly administer FSB provisions. FSB report contents are specified in attachment 1. The FSB report is reviewed and approved as designated by AFS-1.

7.7.2 FSB Report Distribution. The FSB report is distributed to FAA field offices for implementation in approval of particular operator's programs. The FAA technical requirements described in FSB reports are primarily intended for FAA field office use in administration of FAR, but they are also made available to the public on request. Operators receive reports or pertinent provisions through their respective FAA certificate holding district offices (CHDO), industry associations, or the manufacturer or modifiers. Limited copies of FSB reports are also publicly available through FAA Aircraft Evaluation Groups (AEG's) or other Flight Standards district offices, and in some instances manufacturers, modifiers, or other sources may redistribute FSB reports or portions of reports.

7.7.3 FSB Report Implementation. FSB requirements, recommendations, and guidance are provided to FAA field offices through FSB reports for each type, common type, or related type, including variants. These reports are directives to FAA offices to identify acceptable methods of applying pertinent FAR to each specific operator. FSB provisions set acceptable standards by which FAA inspectors approve, review, correct, or limit individual operator programs. The FSB report is the basis for approval of training, checking, and currency programs approved by each FAA office. The report is also the basis for airmen certification by FAA or operators and surveillance of operator programs. Principal inspectors may approve individual operator's programs which meet or exceed master requirements, but they cannot approve programs which are less than master requirements. Geographic inspectors use report provisions to assure application of correct standards for inspections conducted and especially for review of programs conducted at crew bases under their surveillance. Aviation safety inspectors, aircrew program managers (APM's), and aircrew program designees (APD's) use the report as the basis for administration of oral examinations, simulator checks, flight checks, proficiency checks, IOE, and for review of particular programs at a principal inspector's request. Preparation and application of ODR's by operators is described in section 8. Review and approval of ODR's by FAA PI's is covered in section 9.

5/13/91

AC 120- 53
Appendix 1

7.8 FSB Report Revision.

7.8.1 General FSB Revision Process. A general FSB revision process is established to update standards and to allow adjustment of the standards where an applicant or operator can show that revision is appropriate. This is done through periodic FSB meetings in conjunction with flight operations evaluation board (FOEB) meetings. Major modifications to FSB requirements are accomplished through the same process as initial requirements and may include subsequent FSB public meetings. Meetings may be needed annually for active fleets with numerous change requests. Meetings may be needed infrequently for types and variants not undergoing significant change. A provision is made for accommodation of minor revisions that can be done on short notice in the interim periods between formal FSB meetings. Revision requests approved between meetings would be validated at subsequent FSB meetings.

7.8.2 Procedures for Requesting Revisions to Master Requirements. MCR's, MDR's, or other provisions of the FSB report may be modified based on requests to the FSB by:

- a) U.S. operators through respective PI's;
- b) manufacturers through AEG's;
- c) other interest groups, foreign authorities, foreign operators, or other organizations through the AEG's or as designated by AFS-1.

When requests with supporting justification are received by the AEG/FSB, a determination is made as to whether the request can be addressed immediately, whether a full board meeting is needed, or whether additional testing, evidence, or supporting documentation is required. The person or organization making the request is notified of the process planned for FSB resolution of the request. Once the method of addressing the change is determined, the request is scheduled for consideration in the designated time frame, and any necessary testing is arranged. Upon completion of testing and review by the FSB, revisions are made to the MDR's, FSB report, or associated documentation in a manner similar to the initial FSB report and findings.

7.8.3 Revision for New Variants. When a manufacturer or modifier proposes to develop or add a significant aircraft variant to a fleet, MCR's, MDR's and other FSB provisions must be revised to address that variant aircraft. If a manufacturer or modifier initiates this action, the procedures noted in section 7 regarding initial determination of minimum training, checking,

5/13/91

currency and type rating requirements are followed. If an operator proposes to add a significant variant that is not covered within an existing MDR, for example a foreign manufactured aircraft, principal inspectors should consult with pertinent FSB chairman through the AEG. The FSB will determine the best method of addressing the development of the necessary MDR tables. This is particularly important for older aircraft fleets in which differences may be significant, but manufacturer support is no longer available, or for aircraft imported into the U.S. for Part 121 use that have otherwise been used only by foreign operators.

7.8.4 Revision for Aircraft Modified by Operators. When an aircraft is to be modified by a Part 121 operator, the principal inspector must determine if the change affects MDR's, example ODR's, or other FSB report provisions. The criteria to be used for this assessment is whether the difference affects crew knowledge, skills, or abilities pertinent to flight safety. If a change meets this criteria, the operator should supply the PI with a difference description and analysis of the effects of the difference. The PI makes a preliminary estimate of the difference levels, variant groups, or other provisions affected and advises the applicable FSB/AEG. The AEG/FSB may concur with the PI's assessment or require other action. If FSB action is required the AEG will initiate that action through the FSB chairman. The FSB may require that additional information or analysis be provided or that the entire test process or parts thereof, be applied. The AEG may authorize the PI to approve assignment of the difference level and associated requirements at A or B level. In any case if MCR's or MDR's are to be adjusted, the approval will result in a change or update to apply to any or all operators. If the changes are beyond level B the full FSB process is applied.

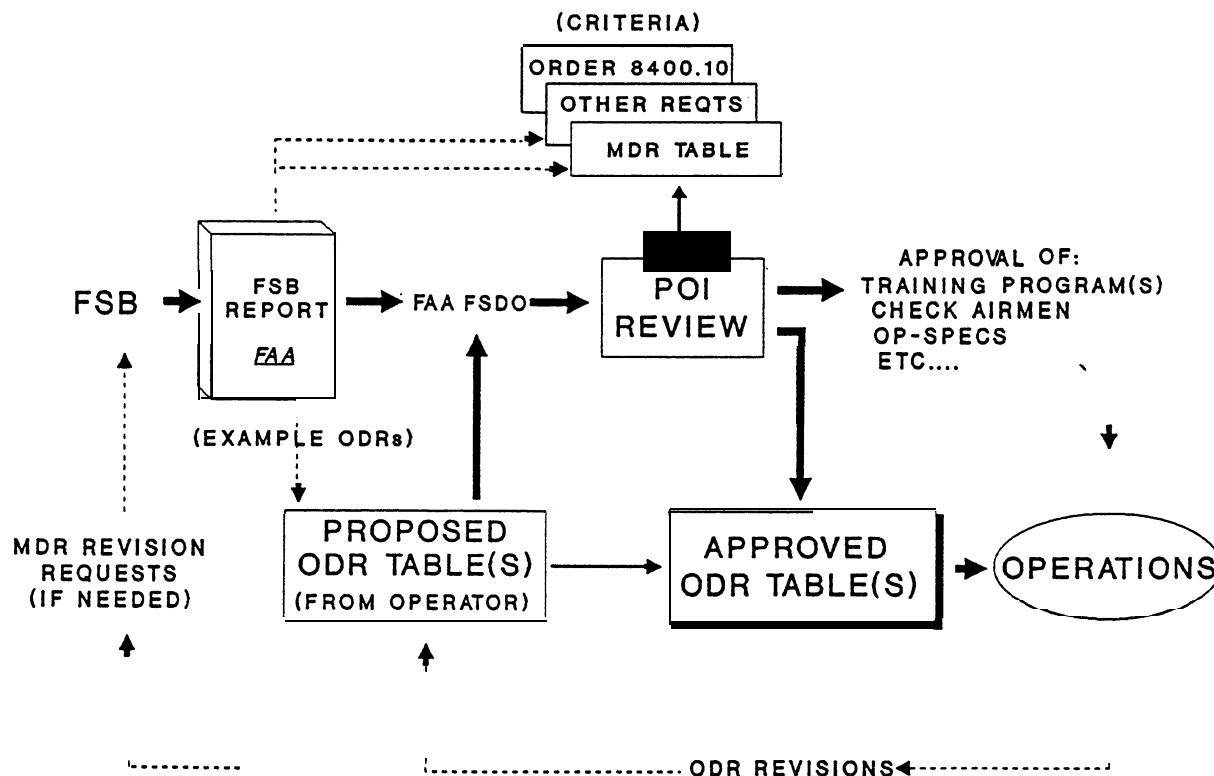
8. AIR CARRIER APPLICATION OF FSB PROVISIONS, PREPARATION, USE, AND REVISION OF ODR's.

8.1. General

8.1.1 Process Overview. FSB reports contain MCR's, MDR's, and other provisions which are applied by FAA offices in approving operators' programs. MCR's are applied generally to an operator's proposed programs, and MDR's are applied through a particular method which identifies operator specific requirements (ODR's) and compliance methods. Application of MCR's, MDR's, and other FSB provisions are one means to ensure crew qualification for safe air carrier operations. This is necessary so that regardless of which aircraft or variants crews fly, uniform training, checking, and currency standards are met within the constraints of the FAR. This section describes operator application of MCR's, MDR's, and other FSB provisions for training, checking, and currency. It primarily focuses on ODR table development and FAA approval of operator's programs for mixed fleet flying. Although addressing general requirements through MCR's, the process primarily focuses on criteria for approval and management of specific operator mixed fleet flying programs involving differences and variants. This is done through operator preparation and FAA approval of ODR's for each operator. When variants are used in mixed fleet flying, this AC's provisions and FSB provisions comprehensively address differences training, checking, and currency requirements for each variant. In some instances the FAA may limit the number of different variants permitted in mixed flying. This AC's provisions may also be used for transition credit when crews qualify for assignment to a different variant. In this instance ODR's are used to identify credits or constraints when crews leave one type of aircraft for operation of a related variant even if mixed fleet flying does not occur.

The overall process for operator application of MCR's, MDR's, and development, approval, use, and revision of ODR's is shown in figure 8-1.

ODR TABLE PREPARATION AND USE



KEY

MDR . MASTER DIFFERENCE REQUIREMENTS
ODR . OPERATOR DIFFERENCE REQUIREMENTS
POI . FAA PRINCIPAL OPERATIONS INSPECTOR
FSB . FAA FLIGHT STANDARDIZATION BOARD
OP-SPECS . OPERATIONS SPECIFICATIONS

FIGURE 8-1

8.1.2 Availability and Use of FSB Information. FAA FSB requirements are made available to operators through FAA certificate holding district offices (CHDOs), manufacturers, modifiers, industry trade associations, or other sources. Requirements are applied by individual operators when preparing initial programs or difference programs for specific fleets.

8.1.3 FSB System Enhancements. Aspects of the FSB system have previously been used by FAA and industry for formulation of initial requirements for new aircraft types and approval of initial operators. However, with this AC the process is formalized, extended to specifically address differences between variants, made a continuous process, and is standardized to use a common format for description, evaluation, and approval of individual operator programs. Previously, FAA requirements were informally addressed during FAA review of operators' proposals when those operators initially developed training and checking programs. Although requirements were applied to each transport aircraft and operator, they were not always uniformly applied, were not coordinated outside of FAA, and were described in a variety of ways in internal FAA memos or FSB reports which were not directives. Provisions were applied to varying degrees through the FAA principal inspector (PI) approval process. Distribution of criteria formerly was limited to FAA offices. Operators and the public may not have always been aware that these criteria were implicitly being applied by FAA offices to ensure safety. Examples of provisions previously applied include type ratings designations, training footprints or check maneuvers to be accomplished, training device limitations, or other special requirements such as check maneuver waiver of "no-flap" landings. While it was FAA policy that only those programs meeting FSB provisions were found acceptable for a particular type and operator, there was not a means to ensure consistent approvals by PI's due to a wide range of situations, unfamiliarity with the process, and uncertainty on the part of applicants about FAA requirements. This AC standardizes provisions in FSB reports including MCR's, MDR's, example ODR's, examples of acceptable training programs, and compliance checklists for use by FAA offices. This provides the FAA and industry with a single publicly available source document which describes FAA criteria applicable to a particular type, common types, related types, or variants.

8.2 Application of Master Common Requirements (MCR's).

8.2.1 Operator Use of MCR's. MCR's are included in FSB reports to identify criteria used in approving use of a new aircraft type for Part 121, for approval of an aircraft type which is new to a particular Part 121 operator, and for addressing requirements which are common to any variant. MCR provisions are applied by operators in development and specification of training, checking, and currency programs. MCR's are considered during manual development, submission of training programs to FAA for approval, development of checking procedures, and other such activities. Any means of addressing MCR's is acceptable as long as programs proposed by operators

satisfy MCR's. Direct use of MCR's by operators in program development can facilitate approval of an operator's programs by an FAA PI. This is especially pertinent for introduction of new types or variants since addressing criteria beforehand that will later be used by PI's in the review of an operator's proposed training and checking program will facilitate timely preparation, review, and approval. MCR's typically address sample training program content, training footprints, checking profiles, and other items which are considered acceptable for approval by FAA PI's.

8.2.2 MCR's for aircraft previously used in Part 121 service. MCR's for aircraft previously used in Part 121 service generally state criteria previously applied by FAA for that type including criteria common to all variants. Thus, except for unusual circumstances, programs previously approved already meet MCR's and continue to satisfy FAA requirements. Additional program review or administrative actions are not necessary unless compliance with present FAA criteria is uncertain. As such, operators continue to comply or begin to comply with MCR's for each aircraft whether or not variants are flown.

8.2.3 Aircraft without MCR's or FSB reports. When no MCR's are shown in an FSB report or where no FSB report is prepared for a given type (older aircraft like the CV580), new program proposals or programs previously approved are considered acceptable if they meet FAR and standard FAA policies. No special review or action on the part of PI's or operators is necessary to otherwise address MCR's.

8.3 Application of Master Difference Requirements (MDR's) and Preparation and Use of Operator Difference Requirements (ODR's).

8.3.1 Need for ODR's. When mixed fleet flying is proposed or is occurring at the time an FSB report with MDR's is published, air carriers prepare the necessary ODR table proposals to describe their particular fleet and show compliance methods. This is done to assess effects of differences, plan compliance methods, and to obtain principal inspector approval for that air carrier's specific program. ODR tables must be prepared and approved by the FAA for each fleet in which FSB requirements have been established (e.g., B737 fleet, B747 fleet,...) in accordance with FSB provisions.

8.3.2 Operator Responsibilities. The operator's responsibility includes:

- (a) Specification of a base aircraft;
- (b) Identification of differences between the base aircraft and variants involved in mixed fleet flying;
- (c) Preparation of proposed ODR tables;
- (d) Assessment and description of the effects of the differences on training, checking, and currency;

(e) Proposal of training, checking, and currency methods consistent with MDR's and FSB provisions;

(f) Presentation of proposed ODR tables with necessary supporting information to the FAA principal inspector for approval; and

(g) Revision of ODR tables when aircraft are introduced, modified or phased out, devices change, or MDR's change.

8.3.3 Use of Standard ODR Format. A common format for ODR tables is followed to facilitate preparation, review, use, comparison with Master Requirements, and to ensure consistency of application and approval by principal inspectors. The common format is used in all cases where ODR tables are required except when only a few minor differences exist and level A applies. In this event letters between an operator and FAA containing the necessary information and approval may suffice if acceptable to the PI.

8.3.4 ODR Hard Copy or Computer Implementation. Although ODR's use a standard format, they may be implemented in either hard copy or in a computer based system. ODR's may include extra or additional information and be tailored to operator needs as long as standard informational is provided and required information can easily be identified. Use of hard copy or computer generated versions of standard forms provided by FAA in Attachment 3 of this Appendix is preferred and facilitates review, approval, and comparison.

8.3.5 Minimum Threshold for ODR Preparation. In the event of mixed fleet flying, a minimum threshold for preparation of ODR tables occurs when differences exist which potentially affect knowledge, skills, or abilities necessary for flight safety. Differences not related to this criteria need not be addressed in ODR tables.

8.3.6 ODR Description and Examples. ODR's are described in section 6. Examples of acceptable ODR tables for a particular type are shown in each FSB report. A set of example ODR tables for several particular B737 variants is included in attachment 3. An example of several pages from an ODR table for a B737 variant is shown in figure 8-2 and figure 8-3 below. Figure 8-2 shows the application of ODR's to address systems differences and compliance methods from a B737-300 base aircraft to a B737-400 variant

8.3.7 In figure 8-2 differences are grouped in a convenient order related to a typical operations manual. Air Transport Association (ATA) code numbers are shown for cross reference. The "Remarks" column depicts differences and the "Flight Characteristics" and "Procedures" columns address effects of differences. Compliance methods within provisions of the FAA's MDR's for the B737 (figure 6-2) are shown at the right of the diagram. The abbreviation AVT/SU in this example ODR table means audio

Appendix 1

visual training and stand up instruction. CBT denotes computer based training and OE identifies that operating experience is required. Figure 8-3 shows an example of use of an ODR table to address maneuver differences between a B737-200ADV base aircraft and B737-300 variant.

5/13/91

AC 120-53
Appendix 1

OPERATOR DIFFERENCE REQUIREMENTS (ODR) TABLE

B737-300 TO B737-400 - SYSTEMS DIFFERENCES

(EXAMPLE ITEMS)

DIFFERENCE AIRCRAFT: 737-400 BASE AIRCRAFT: 737-300 APPROVED BY (POD):				COMPLIANCE METHOD				
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRAINING			CHKG/CURR	
				LVL A	LVL B	LVL C	FLT CHK	CURR
21 AIR COND. & PRESSURIZA- TION	• 3 ZONE AIR CONDITIONING SYS. • REVISED CONTROLS AND INDICATORS • TRIM AIR	NO	SEE APP.	TNG HND- OUT				
22 AUTOFLIGHT	• REVISED DISENGAGE BAR -TO/GA MODE NOW AVAILABLE WITH BOTH F/D SWITCHES OFF	NO	NO	TNG HND- OUT				
24 ELECTRICAL	• HIGHER GENERATOR RATINGS	NO	NO	TNG HND- OUT				
27 FLIGHT CONTROLS	• INCREASED FLAP PLACARD SPEEDS	NO	NO	TNG HND- OUT				
34 NAVIGATION	• FMCS UPDATE 4; SEVERAL NEW CDU PAGES WITH ADDED INFO/ FEATURES	NO	NO	TNG HND- OUT				
LIMITATIONS	• GROWTH RELATED CHANGES	NO	NO	TNG HND- OUT				B

FIGURE 8-2

5/13/91

OPERATOR DIFFERENCE REQUIREMENTS (ODR) TABLE

B737-200ADV TO B737-300 - MANEUVERS DIFFERENCES

(EXAMPLE ITEMS)

DIFFERENCE AIRCRAFT: 737-300 BASE AIRCRAFT: 737-200 ADVANCED APPROVED BY (POI): _____					COMPLIANCE METHOD				
					TRAINING			CHKG/CURR	
MANEUVER	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR	
NORMAL TAKEOFF, CLIMB, CRUISE, DESCENT, INSTRUMENT APPROACHES, LANDING	- OPTIONAL USE OF AFDS, & A/T (ALSO AN OPTION FOR -200 AFCS AIRPLANES) - OPTIONAL USE OF FMCS	NO	SEE APP		AVT/ SU	FMS/ AT	C* + OE	D 90 DAYS + 3 FLT SEG.	
NON-NORMAL MANEUVERS	- OPTIONAL USE OF AFDS, & A/T (ALSO AN OPTION FOR -200 AFCS AIRPLANES) - OPTIONAL USE OF FMCS	NO	SEE APP.		AVT/ SU	FMS/ AT	C*		

FIGURE 8-3

8.3.8 The maneuvers shown on the ODR Table of figure 8-3 are grouped in an order related to Part 61, Appendix A; Part 121, Appendix F; or AQP flight qualification evaluation. The "Remarks" column depicts differences and the "Flight Characteristics" and "Procedures" columns address effects of differences. Compliance methods within provisions of the B737 MDR's (figure 6-2) are again shown at the right of the diagram. "FMS/AT" means flight management system/advanced training device. The reference "SEE APP" in figure 8-3 under the procedures change (PROC CHNG) column, refers the reader of the ODR table to an appendix to the table which had been prepared by the operator to more fully list and explain the particular procedural changes that pertain.

8.3.9 Other Use of ODR's is Permissible. The ODR process may be used for other applications such as for flight attendant or dispatcher qualification tracking, but such use is not required as part of this AC's provisions.

8.4 Selecting Base and Variant Aircraft.

An operator chooses a base aircraft from one of the variants or variant groups which that air carrier operates. Base aircraft are defined in section 5. Additional information regarding base aircraft selection is in section 9.

8.5 Identification of Differences and Analysis of Effects of Differences.

Differences must be described between base aircraft and each variant to be flown. This may be done from base to each variant or from base to the first variant, first to second, second to third, until each variant is addressed in a way which satisfies all MDR requirements relative to the base aircraft. As long as a complete and unambiguous relationship can be drawn from the base aircraft to each variant and as long as all MDR requirements are met from the base aircraft to each variant, there is no need to describe each possible combination of variants. This permits a comprehensive identification of differences that exist in the fleet, determination of the effects of those differences, and shows compliance methods. Differences should be categorized by design, systems, and maneuvers and generally follow operations manual or flight manual organization to facilitate use and review. Effects of differences are stated in terms of effects on flight characteristics and procedures. Procedures include normal, non-normal, alternate, and recall procedures, as applicable. Since complete descriptions may be too lengthy for direct incorporation in ODR tables, appendices or references to other operator documents may be used to describe differences or effects. Some differences or effects may be repeated in the analysis. For example, an FMS difference may be noted in both a navigation system section and maneuver section related to preflight setup. This is recognized, and it is not necessary to limit difference descriptions to preclude overlap. The objective is to assure that each difference which pertains to crew training, checking, or currency is identified and addressed.

8.6 Identification of Compliance Methods.

Once differences and difference effects are described, methods of comprehensively addressing each difference (compliance methods) are shown. As with the difference descriptions, redundancy may occur. The same training or checking compliance item shown for one item may also be related to and credited for other items. The objective for description of compliance methods is to show that each difference is addressed in some appropriate way, to show that the method and level chosen is consistent with the **FSB MCR's**, **MDR's**, example **ODR's**, and is at a level at least equal to that required by the **MDR's**.

8.7 When Proposed ODR Compliance Methods Do Not Meet MDR's.

If proposed **ODR** compliance methods do not satisfy **MDR's** or other **FSB** report constraints, several alternatives exist:

(a) Differences may be reduced to levels at which compliance is possible or differences may be eliminated by modification of aircraft, systems, or procedures;

(b) Other training methods or devices may be acquired, leased, or otherwise applied that fully comply with **MDR's** and other **FSB** provisions;

(c) Crew assignments may be separated for a fleet so that mixed-flying of variants does not occur;

(d) **MDR** change proposals may be requested through FAA PI's to the **FSB**. If **FSB** authorized changes to the **MDR's** are made, the operator may then apply the revised criteria; or

(e) The operator may seek alternate approval following the process described in section 9.7.

8.8 Maximum Number of Variants.

Even though each base and variant pair may individually comply with **MDR's** and other **FSB** provisions, other limitations may also constrain mixed fleet flying. In order to preclude cumulative effects of differences for multiple variant aircraft from adversely affecting crew performance, the FAA sets guidelines for the maximum number of variants to be flown. At difference level A the number of variants is greater since differences are fewer and less significant; whereas at level D or level E differences are greater. To accommodate differences as difference levels increase, increasing limitations are placed on the number of variants that may be flown at the higher levels. Specific guidance to PI's for approval of multiple variants is given in section 9.15.

8.9 Application, Review, and Approval.

The FAA review and approval process is described in section 9. The process is summarized here to facilitate ODR table preparation. Application for differences program approval is made by operator submission of the proposed ODR tables and necessary supporting information to the CHDO principal inspector. The application should include ODR tables, any appendices to the tables necessary for evaluation of the proposal, a transition plan if needed, and a proposed schedule for implementation. PI's may require review of pertinent and additional information such as copies of bulletins, manuals, or other training materials prior to ODR approval. Training device review and approval may also be necessary prior to ODR approval if devices not approved by the PI or evaluated by the NSET are proposed. Sufficient lead time must be provided to the FAA for review. Lead time depends on the complexity of program, proposed difference levels, number of variants, other air carrier precedents already set, FAA experience with the proposed variants, training devices, methods, and other such factors. As a guideline, many non-controversial level A changes can be reviewed and approved in a few days. Complex programs with many variants can require months for review and approval if FSB review and public comment on MDR changes are necessary. It is the operator's responsibility to consult with the PI to ensure that sufficient lead time is provided to review initial submissions or changes. At least 60 days notice is acceptable for most programs. Following air carrier submission of the program proposal, PI's compare the proposed ODR with the FSB report provisions including the MDR's. Pertinent FAA policy directives (Air Carrier Handbook) are consulted for interpretations or guidance in accomplishing the review. In certain instances the PI must consult with the FSB prior to ODR approval. If ODR's are consistent with FAA policies and within constraints of the MDR's and example ODR's, the PI approves the air carrier's ODR tables and its proposed differences program. When approved by FAA, ODR's establish the basis for training, checking, and currency programs for a given fleet for that air carrier. Part 121 operations may only be conducted following air carriers implementation of ODR's provisions.

8.10 Implementation Provisions (Transition Period).

In certain instances implementation provisions (transition periods) may be necessary to permit operators a reasonable time to comply with FSB requirements. This is necessary when FSB provisions are initially set or revised and provisions require lead time for program preparation, device acquisition, or to revise previously approved programs. FAA approval of transition provisions are discussed in section 9.17 and in individual FSB reports for each type aircraft.

8.11 ODR Revision.

ODR revisions are initiated when changes occur in an operator's fleet

regarding differences, difference effects, or compliance methods. ODR revisions are appropriate when changes occur which affect crew knowledge, skills, or abilities pertinent to flight safety. Examples of program changes or factors that may require ODR revision include:

- (a) Addition or deletion of variants in a fleet;
- (b) Modification of base aircraft or variants in a fleet;
- (c) Change of base aircraft;
- (d) Discontinuation of use, addition of new or modification of training devices referenced by ODR's;
- (e) Revision of training methods with a resulting change in compliance levels;
- (f) Changes in effects of differences such as revised procedures, performance, or flight characteristics;
- (g) FAA revision of MDR's or other FSB provisions;
- (h) Adverse operating experience or training and checking experience which dictates inadequacy of ODR's, MDR's, or other FSB provisions;
- (i) FAA surveillance results, enforcement actions, or failure of an operator to comply with provisions of their approved ODR's;
- (j) Other factors as determined by the principal inspector.

Revisions are approved using the same procedures as for initial ODR's.

9. FAA REVIEW AND APPROVAL OF OPERATOR PROGRAMS.

9.1 General.

9.1.1 FAA Responsibilities. FAA has the responsibility for review, approval, and continuing surveillance of individual air carrier programs consistent with this advisory circular and FSB provisions. Within certificate holding district offices (CHDOs), principal inspectors (PI's) have the responsibility for program review and approval. PI's are supported by aircrew program managers (APM's) or airmen certification inspectors for technical analysis related to each particular fleet and by air carrier inspectors (ACI's) and geographic inspectors for surveillance of an operator's programs which must be in compliance with FSB report provisions. This applies at both main bases and crew bases and training sites away from the CHDO (e.g., outlying crew bases contract training facilities). In addition to review, approval, and continuing surveillance

of operator programs, CHDOs and other district offices manage airmen certification consistent with AC criteria and FSB provisions. This includes supervision of FAA inspectors and air carrier check airmen who apply FSB initial or recurring checking provisions. See section 10 references to airmen certification.

9.1.2 FSB Report Availability to FAA. FSB reports are available from assigned Aircraft Evaluation Group (AEG's) to Flight Standards District Offices (FSDO's) in hard copy on a limited copy basis and by computer through the Aviation Safety Analysis System (ASAS). FSB reports are updated as changes are made by the FSB/AEG. Current revisions must be used.

9.1.3 Availability of FSB reports to Operators and Application by Operators. Air carriers may obtain FSB reports through various sources. PI's and CHDO's are the usual source of FSB requirements for operators. AEG's, manufacturers, aircraft modifiers, other air carriers, or industry trade associations are other possible sources for operators to get copies of FSB reports or pertinent FSB requirements. When applicable, operators should become familiar with FSB provisions and this advisory circular provisions, prepare proposals, establish compliance, and seek approval in a timely manner. It is the operator's responsibility to plan sufficient lead time for the approval process to support air carrier operating plans. Late application or application with oversimplified or unrealistic proposals do not relieve an operator of the requirements for timely submission, FAA approval, and operator implementation of appropriate provisions prior to Part 121 service.

9.1.4 Approval Basis. FAA approvals are based on FSB report findings and policy guidance included in FAA directives (e.g., Air Transportation Operations Inspector Handbook, Order 8400.10, etc.). Except as provided for in transition plans, all preparations must be complete and provisions approved prior to conducting training, checking, or establishing currency under this AC and an FSB report.

9.2. Application of MCR's.

9.2.1 Applicability of MCR's to New Approvals. MCR's apply when an operator develops the first program for a given type. MCR's are usually first addressed when a program for a new aircraft type begins or when introducing an aircraft type that is new to that operator. Since mixed-fleet-flying often does not take place, MDR's and ODR's may not apply at that time. MCR's are included in FSB reports to comprehensively list FAA criteria for approving use of a particular aircraft type for Part 121, whether or not variants are flown. MCR's state criteria applied by FAA for a given type including criteria common to all variants.

9.2.2 Applicability of MCR's to Programs Previously Approved. For programs previously approved by FAA for a particular type, MCR's generally should

5/13/91

already be met since MCR formulation takes into account previous FAA approval actions. Except for unusual circumstances such as program changes, additional review, or administrative issues, further action by either a PI or an operator are not necessary. For example, program adjustments may be needed if MDR's and ODR's compliance with present FAA criteria described by MCR's is uncertain. Operators continue to comply or begin to comply with MCR's for each aircraft whether or not variants are flown.

9.2.3 PI Approvals to be Consistent With MCR's. PI's approve programs if carrier's programs comply with MCR's described in the FSB report. This includes related information such as having programs which are at least the equivalent of example training programs shown in the FSB report, compliance checklist items are addressed, and relevant information in other FAA directives such as Order 8400.10 is applied. The appropriate AEG should be consulted if doubt exists regarding program adequacy or compliance with MCR's. The approval process regarding MCR's is through training program approval, check airman approval, op-spec approval and other such approvals in accordance with FAA policy. Specific or separate approval documents for MCR's are not necessary since MDR provisions are indirectly incorporated into other operator documents and programs.

9.3 Operator Application of ODR's.

9.3.1 Operators Using Variants in Mixed Fleet Flying. If FSB requirements are published, air carriers operating variants in mixed fleet flying must apply provisions of this advisory circular and the FSB report. This must be done prior to Part 121 use of any variant having crew qualifications established under this AC or prior to the end of the specified transition period for other variants. AC criteria and FSB MDR's must be applied any time crews fly variants of an aircraft between training or checking events (e.g., 6 month-checks or AQP evaluations). Situations like flying several variants in the same bid line, alternate bidding of variants from month to month, flying a base aircraft but retaining dual qualification to allow assignment to trips in reserve are each considered mixed fleet flying and require this advisory circular application.

9.3.2 Threshold Requiring ODR Preparation. Even though an air carrier has different configurations of aircraft used in mixed fleet flying, there is some threshold below which ODR tables and principal inspector approval is not required. The threshold requiring AC and ODR application occurs when differences in variants affect crew knowledge, skills, and/or abilities pertinent to flight safety. If systems, controls, indications, procedures, or maneuvers are different for variants and these differences have an effect which is of significance related to what the crew needs to know or do for safe flight operation, and mixed fleet flying occurs, then an operator must prepare ODR tables and seek FAA approval (e.g., similar switches have a different function, mode logic is different, limits are different). Conversely, ODR tables would not need to be prepared in situations which do not affect flight safety, (e.g., seating configuration differences with no change in emergency

5/13/91

AC 120-53
Appendix 1

evacuation knowledge or duties). In such instances ODR tables are not needed even though crews routinely operate several different aircraft. A minimum threshold is set to preclude unnecessary administrative assessment of variants which have no safety implications. If changes to aircraft or introduction of variants do not affect flight crew knowledge, skills, or abilities related to flight safety, then such changes need not be considered in addressing FSB or this advisory circular provisions.

9.3.3 FAA Review of ODR Proposals. After preparation the carrier submits proposed ODR tables and supporting information to the CHDO and PI for review and approval. PI's evaluate the following:

(a) The operator has made an appropriate identification of a base aircraft;

(b) Operators have comprehensively identified differences in the particular fleet. This includes appropriate ODR table comparisons between the base aircraft and each variant;

(c) The operator's assessment of the affects of differences on flight characteristics and procedures for the base aircraft and each variant are suitable and valid;

(d) The compliance methods listed are consistent with the requirements of the MDR tables, footnotes, other pertinent FSB report provisions, and FAA Orders 8400.10 and related advisory circulars;

(e) ODR provisions adequately address any "subtle differences" between similar variants which have a significant possibility of inducing potentially serious crew errors;

(f) Training materials, methods, devices, and simulators proposed are acceptable, approved by the National Simulator Evaluation Team (NSET) if necessary, or if FSB provisions apply the ODR tables meet FSB constraints;

(g) Aviation safety inspectors, including aircrew program managers (APM's) and aircrew program designees (APD's), are prepared to apply FSB report checking standards;

(h) Implementation plans are adequate and consistent with FSB provisions and other FAA policy; and

(i) Other factors determined necessary by the PI are considered and any requirements met.

9.3.3.1 As the basis for the principal inspector's evaluation of the suitability of a particular air carrier's proposed ODR table, items are compared with example ODR tables and the MDR's provided in the Flight Standardization Board report. The MDR always remains the primary basis for

comparison. However, in the absence of identical situations to the FSB report, a PI also may consider other similar cases already approved by FAA. For example, the PI may compare the applicant air carrier's proposed tables with other tables previously approved for other operators, for other similar variants, for other types with analogous variants, or combinations of these. The AEG should be consulted in the absence of conclusive guidance in making such judgments. Guidance for evaluation of specific system or maneuver items may be found by comparison of the proposal with the example ODR table shown in the FSB report, other approved ODR tables for the same variants, or similar tables for other variants. While the air carrier may use devices, techniques, or methods of an equal or higher difference level, they may not exclusively use methods or devices of a lower level. Critical methods must be at least at the level specified by the FSB on the MDR's and shown in the example ODR table. Actual ODR tables proposed by the air carrier may show a variety of compliance methods to satisfy a particular item, ranging from level A through the level required by the MDR's. For example, if the MDR requirement is a minimum of level C, the air carrier may propose to use a combination of level A bulletins, level B slide tape presentations, as well as level C training devices to satisfy pertinent items. However, at least level C must be shown for critical items. The operator may choose to satisfy a level C MDR provision with level D or level E methods.

9.3.4 ODR Review Example. The following is an example of the process for review of a specific item on a proposed ODR table. For each proposed ODR item both the FSB example ODR table and MDR's are consulted and compared with the operator's proposal. If the MDR's specify that level C devices are needed for training, checking, and currency between the base aircraft and a particular variant and the example ODR table shows applicable level C systems differences or maneuvers, then the principal inspector should ensure that the proposed ODR table submitted also shows at least level C for those pertinent systems or maneuvers.

9.4 Base and Variant Identification.

9.4.1. Selecting the Base Aircraft. Base aircraft are defined in section 5. In general, base aircraft are particular variants used as reference for comparison of differences that affect, or could affect, flight crew knowledge, skills, or abilities pertinent to flight safety. A base aircraft should typically be the particular variant which the operator trains to first, the variant which the operator has the largest number, the variant most crews fly frequently, or the variant which represents a configuration which the air carrier eventually will have as a standard. Other variants may be selected as a base aircraft when the most logical variant is being phased out, converted to a new configuration, or other such factors. Base aircraft may be redesignated at the discretion of the operator with FAA concurrence. Base aircraft are identified by make, type, model, and series or other distinguishing classifications. Classification should distinguish pertinent differences in configuration, handling characteristics, performance, procedures, limitations, controls, instruments, indicators, systems, installed

equipment, options, or modifications. A base aircraft may either be a single variant or a group of variants with the same characteristics. Operators designate base aircraft by make/type/model/series (DC9-31, B757-232...), FAA registration ("N number," e.g., N663US), air carrier tail number (aircraft 801-820), or other means which can uniquely distinguish between each of an operator's variants.

9.4.2 Identifying Variants. A variant is an aircraft or a group of aircraft with the same characteristics that have pertinent differences from a base aircraft. Pertinent differences are those which require different or additional flight crew knowledge, skills, and/or abilities that affect flight safety. Differences considered pertinent are those relating to configuration, handling characteristics, performance, procedures, limitations, controls, instruments, indicators, systems, installed equipment, options, or modifications. Variants usually, but not always, are a different model or series than an aircraft identified as a base aircraft (e.g., a DC9-50 is a variant compared to a DC9-31 base aircraft). Variants may also exist within a model/series due to differences in installed equipment (e.g., a B737-200 ADV with a PDCS, Omega, SP-177 autopilot, and autoland is a different variant than another B737-200 ADV with a SP-77 autopilot, and basic VOR/DME navigation). The number of variants depends on how many groups of aircraft have distinct differences (e.g., B737-122, B737-232, B737-287, and B737-3B7 aircraft are each variant groups). When designated in FSB reports, any aircraft included in that report in an MDR table is considered a variant, even though some aircraft may have a "common type rating" or be a different type designation (e.g., a B757-200, B767-200, and B767-300 are related as variants even though the B757 and B767 have different type certificates). As with base aircraft, operators designate variants by model/series, FAA registration "N number," air carrier tail number, or other classification which can uniquely distinguish pertinent differences between each variant group and a base aircraft and between each other variant. Variants are typically those aircraft within a particular fleet in which crews receive differences training after initial qualification is completed, aircraft which the air carrier has fewer in the fleet (e.g., leased aircraft, interchange aircraft), or aircraft in an interim configuration which the air carrier will eventually modify to a standard (e.g., a few aircraft have Omega and PDCS installations and other aircraft are being equipped). A variant or group of variants may be designated or redesignated at the discretion of an operator, manufacturer, or modifier. However, for any designation or redesignation, it must be possible to clearly relate any variants identified to variant groups shown on the FAA's MDR table.

9.4.3 Accounting for Each Variant. The important factor in base and variant identification and ODR table preparation is that regardless of the combination used there should be direct and complete traceability of both differences and compliance methods from the base to each variant that crews are assigned to fly. There must be a clear description showing the adequacy of compliance methods to assure proper training, checking, and currency to safely operate each variant assigned. In the event that the air carrier has more than one variant to compare with the base aircraft, the ODR table can be prepared in

5/13/91

several ways. To illustrate acceptable methods, three examples are shown for an air carrier operating DC9-30s, MD-82s, and MD-87s:

(a) The first method is to identify the DC-9-30 as the base aircraft, then list differences from the DC-9-30 to the MD-82 and from the DC-9-30 to the MD-87.

(b) The second method is to consider the DC9-30 as the base aircraft, provide differences and compliance methods from the DC9-30 to the MD-82, and then compare the MD-82 to the MD-87 listing only the incremental differences between successive variants. Even though differences may be described incrementally, MDR requirements relative to the base aircraft must be satisfied.

(c) A third acceptable method would be for the carrier to designate an intermediate variant (e.g., MD-82) as the base aircraft, then compare differences from the MD-82 back to the DC-9-30 and from the MD-82 forward to the MD-87.

9.4.4 Each of these methods is considered acceptable as long as MDR requirements are met relative to the base aircraft, differences and compliance methods can clearly and completely be established, and methods are revised to ensure they remain current as the fleet changes.

9.5 Approval of ODR's.

9.5.1 Approval Method. Following review and determination that an air carrier's program meets pertinent FSB requirements, the principal inspector approves that particular program by signing ODR's. ODR tables are approved for each applicable fleet (e.g., ODR's for the B737 fleet, DC10 fleet,...). Signature of ODR's or revisions, together with other relevant documents such as training programs and Op-Specs, constitute approval by the principal inspector of that air carrier's differences training, checking, and currency program consistent with Part 121 Subparts N and O or the AQP SFAR. ODR tables are used for most programs. In certain instances where variants have only a few minor differences at level A, approval may take the form of a letter including necessary information in lieu of use of tables.

9.5.2 PI Authority at level A and B. Principals have authority at A and B level to make determinations without AEG coordination if compliance methods are within the MDR's. This is important to provide timely response for minor difference requests. The results of these determinations are forwarded to the pertinent FSB for permanent retention, comparison, and future FSB evaluation.

9.5.3. PI Coordination Required At level C and Above. At C, D, and E level the principal inspectors may approve air carrier programs only if the programs are clearly within the requirements of the MDR's and coordination, if necessary, with the AEG has been accomplished. If there is doubt as to whether an air carrier's program meets or does not meet the MDR's, the

5/13/91

AC 120- 53
Appendix 1

principal inspector consults with the FSB well before the air carrier's program approval date to allow time for review and resolution of open issues. If the air carrier request is unclear or less strict than the MDR's requirements, the principal inspector may not approve that program until resolved.

9.5.4 Initial and Final Approval. As with other training programs, principal inspectors may authorize "initial" approval for an assessment period to review program effectiveness. Final approval should be made after suitable experience is obtained (generally within six months) in accordance with criteria in FAA Order 8400.10. Situations in which initial approval is completed but final approval is delayed because of continuous revision or that results are uncertain should be avoided. When air carriers propose to add variants, modify existing aircraft, change base aircraft, phase aircraft out, or take other actions which make the applicability of ODR's unclear, then the ODR tables for that air carrier must be updated. For some air carriers a continuous series of ODR table modifications will occur as its fleet changes. Nevertheless, the ODR tables must be current at all times. ODR tables are used as a primary means for establishing regulatory compliance and managing surveillance of training, checking, and currency programs.

9.6 Principal Inspector Uncertainty Regarding Program Compliance.

The principal inspector must resolve any questions prior to approval if it is not clear that the air carrier's proposal complies with the MDR table and other FSB provisions. When in doubt the principal inspector should consult with APMs, ACIs, other principal inspectors, or Headquarter's personnel who have related FSB application experience. When issues cannot be resolved so as to clearly establish compliance with MDR's or other FSB report provisions, the AEG/FSB should be consulted. Early in program development principal inspectors may need more consultation with FSB members. Whereas in mature programs better examples will be available in FSB reports, other air carrier ODR tables will be available as background information to principal inspectors, and the manufacturers will have larger data bases for air carriers and PI's to draw on to assist in the initial preparation of proposed ODR tables.

9.7 Proposals that do not comply with FSB Provisions.

If the operator proposes a program less restrictive than the requirements of the MCR's, MDR's, or other FSB provisions, then options of section 8.7 apply. If an operator wishes to pursue a proposal less restrictive than the FSB report or MDR's, details of the proposal and supporting documentation should be presented to the principal inspector for forwarding to the AEG/FSB. The PI will evaluate the carrier's proposal and, if justified, forward the proposal with recommendations for revision of MCR's or MDR's.

9.8 FSB Revision Of MCR's, MDR's, or other FSB provisions.

When requested by PI's, the FSB reviews operators proposals and if necessary modifies MCR's, MDR's, and other FSB provisions. If master requirements have been amended and the proposal meets the revised requirement, the principal inspector may approve the proposal. Other operators can also apply for similar approval, credit, or reductions based on the revised FSB report. Major changes in the MDR table may require review by the full Flight Standardization Board. Minor changes or interpretations may be considered by the FSB on an ad hoc basis between FSB meetings for that aircraft type. For some requests changes can be made based on existing or the supplied information. Other changes require documentation of operating experience or other data provided by the applicant. Complex cases may require testing to be conducted by the applicant or the manufacturer prior to the time that the MDR table can be changed. Should the MDR's be updated to accommodate a change request, the proposed ODR can be approved within the new MDR's. For revisions to levels C, D, or E proposals must be forwarded to the FSB for resolution through the formal FSB process which may include a public meeting. At least 60 days should be allowed for FAA evaluation of such proposals.

9.9 ODR Distribution and Record Retention.

Copies of each approved ODR should be retained by the operator and the CHDO then forwards to the FSB for review or permanent retention. When no longer active, ODR tables should be retained by operators as long as they are used as a basis for airman qualification or operations approval for at least 3 years for documentation of crew qualification in the event of subsequent enforcement or accident investigation. If type rating assignments are keyed to ODR program completion or if ODR's may be a factor in establishing eligibility for type ratings, inactive ODR tables may be retained by operators for longer periods to ensure documentation of crew qualification.

9.10 ODR Table Use for Transition Program Credit.

This AC may be applied when crews transition train and check from one variant to another, even though mixed fleet flying is not intended, in order to facilitate and clarify application of previous model experience to a different aircraft. MDR's, ODR's and other FSB provisions are applied the same as for mixed-flying except that maintenance of currency in the base aircraft is not a factor.

9.11 Coordination with APM's, ACI's, and Geographic Inspectors.

Once the approval process is completed for a particular air carrier, principal inspectors should ensure that airman certification inspectors, air crew program managers, air carrier training check airmen, and line check airmen are familiar with applicable provisions of the FSB report to ensure proper application of checking requirements on a continuing basis.

9.12 Proving. Tests.

When a level C or greater variant is introduced following type certification, supplemental type certification (STC), or when introduced by a new operator, proving runs may be needed. Proving runs are usually needed for levels D and E, and at level E regulatory provisions for proving runs must be met. Training flights, test flights, delivery flights, and demonstration flights may be credited toward levels C and D proving requirements if necessary operational experiences are demonstrated and the flights are in accordance with an FAA approved plan. FAA Order 8400.10 describes policies for FAA approval of proving tests.

9.13 Line-Oriented Flight Training (LOFT)/Line Operational Simulation (LOS).

When operators have LOFT/LOS programs and additional variants are approved, the principal inspector must review those LOFT/LOS programs to assure applicability to each variant.

9.14 Initial Operating Experience (IOE) and Supervised Line Flying (SLF).

As described in this advisory circular and FSB reports, IOE is consistent with definitions and requirements of Part 121. Although IOE credit for experience with similar variants or systems is permitted and completion of IOE in simulation is permitted in some instances, certain limitations are placed on IOE. Principal inspectors must approve IOE/SLF in accordance with FSB provisions. IOE and SLF are addressed in sections 5 and 6.

9.15 Limitations on the Total Number of Variants.

9.15.1 Mixed Flying of Multiple Variants. When mixed fleet flying involves crews operating more than a base aircraft and a single additional variant, additional constraints limiting the total number of variants may apply. Operation of multiple variants requires a review by the principal inspector to ensure that crews can retain and properly apply necessary differences information or skills for each variant without confusion between different variants. When more than two variants are flown, principal inspectors must specifically ensure that subtle or compounded differences between the various models do not result in confusion of procedures, maneuvers, or limitations. ODR's proposed for the overall combination of variants to be flown are examined to:

(a) Ensure that multiple differences do not result in confusion of requirements or an excessive level of complexity for flightcrews to adjust to or retain important differences information;

(b) Ensure that subtle variations in differences information are not likely to be mistakenly applied and lead to unsafe conditions; or

(c) Ensure that the amount of differences information is not excessive

5/13/91

and consequently is not applied to the wrong variant or is easily forgotten.

9.15.2 Applicable Limits. The following limits are established for principal inspector approval of multiple variants without coordination with AFS-200 and review of proposed ODR's by the assigned AEG/FSB:

- (a) 5 variants of level A aircraft;
- (b) 4 variants of level B aircraft;
- (c) 3 variants of level C or D aircraft; or
- (d) 2 level E variant aircraft.

9.15.3 When other combinations of aircraft are proposed, an equivalent level of safety must be **established** consistent with the guidelines above. For example, four variants including three at level A and one at level D would be acceptable. When levels D or E variants are flown, two additional variants at level A should be approved at the most, In the event PI's require assistance in determining equivalence, the FSB should be consulted.

9.15.4 Mixed Flying of Related Types. Derivative aircraft that are related **types**, even though level E and a different type rating is assigned, have MDR tables developed and mixed-flying is directly managed (e.g., B747 and B747-400). FSB reports and MDR's are available to principal inspectors and are used for review and approval of mixed-type flying for each variant.

9.15.5 Mixed Flying of Unrelated Types, Without Variants. This AC does not address specific criteria for mixed-flying of different type aircraft that are unrelated (e.g., B-727 and DC-10). Nevertheless, certain of these concepts and precautions should be applied by air carriers or principal inspectors when crews are simultaneously qualified to fly unrelated types. An example would be the completion of a review of procedures of the two unrelated types to ensure that subtle differences in procedures do not inadvertently lead to an inappropriate crew response in an emergency when crews instinctively react from habit, when crews are fatigued, or when distractions occur. In such instances certain procedures may need to be revised even though for an individual aircraft they may be acceptable. This is to reduce the likelihood of crew error when subtle but significant differences exist between types. Such differences, if not highlighted or otherwise addressed, could lead to unnecessarily increased risk when frequently flying different unrelated types. Thus, when crews fly unrelated types (B-727 and DC-10) between six-month checks or six-month training events, operators and principal inspectors should use, but are not required to use, applicable procedures of this AC between the different types. However, if variants exist within the separate types and mixed flying occurs, provisions of this section may apply. When variants also exist within the separate types, certain ODR provisions are necessary even though MDR's and ODR's are not defined between the unrelated types.

9.15.6 Mixed Flying of Unrelated Types, With Variants. Principal inspectors may limit the total number of variants when several unrelated types are flown even though the variants for each type alone may be acceptably covered by ODR's (e.g., 3 variants of B727s and 2 of DC-10s). If one or both types have variants (e.g., 3 variants of the B727 and 2 variants of the DC-10), then ODR's must be applied for variants within each separate type. Provisions of this AC limiting the total number of variants in mixed fleet flying do apply between different types in this situation. ODR's are prepared for B727 variants and separate ODR's address the DC10 variants. Limits are placed on the total number of variants even though unrelated types are involved. For purposes of limiting the number of variants, the separate types are considered level E. Thus, with two separate and unrelated types, at most two additional level A or B variants of either type are permitted without specific AFS-200 approval.

9.16 Compliance Checklist for CHDO's.

FSB reports provide a FAR compliance checklist. The checklist identifies those Federal Aviation Regulations, advisory circulars, or other FAA requirements that have been found to be in compliance by the AEG's for that type aircraft and its variants. Pertinent FAR items not shown on the checklist or items shown but not reviewed by the AEG/FSB for compliance must be reviewed by the CHDO prior to principal inspector approval of operations specifications (Op-Specs) permitting that type or variant to be used under Part 121. Items found not to be in compliance by the AEG/FSB must be reconciled and compliance established prior to Part 121 operations. The compliance checklist is an aid to CHDOs to show the status of those FAR evaluated by the AEG/FSB and does not comprehensively address all possible FAR and advisory circulars that an operator may need to demonstrate compliance with. Op-Specs, exemptions, deviations, or other factors which the AEG/FSB may not be aware of may also apply and may modify compliance status or methods shown in the checklist.

9.17 Implementation and Transition Provisions.

Reasonable Time to Comply. In certain instances implementation or transition provisions may be necessary. Transition provisions are established to permit operators a reasonable time to comply when original FSB requirements are set or when MDR's or FSB provisions are revised which differ from previously approved programs. Transition provision requirements are addressed in each type's FSB report. Transition provisions must comply with any criteria shown in FSB reports. Transition provisions are approved by principal inspectors at the same time ODR tables or revisions are approved. Air carriers conducting mixed fleet flying that do not elect to apply this AC or implement FSB provisions within the period specified by the FSB report require approval as designated by AFS-1.

9.18 Other Applications of this AC's Provisions.

Operators or principal inspectors may optionally apply the processes of this AC to other situations related to mixed fleet flying which are beyond the scope of this AC. For example, the process of describing differences and methods of addressing those differences may **also apply to training** or checking of dispatchers, flight attendants, maintenance, or other safety related personnel. However, there is no requirement to do so, and such applications are at the discretion of the operator in coordination with principal inspectors. If necessary, future provisions may specifically address **mixed-flying** of unrelated aircraft types and such other applications.

9.19 Aircraft Which Do Not Have An FSB Report.

When an **FSB** report is not prepared for a given type, or when **MCR's**, **MDR's**, or other provisions are not shown, programs are approved in accordance with the FAR, Order 8400.10, and other pertinent **AC's**. Special review or action on the part of principal inspectors or operators to address provisions which would otherwise be specified in **FSB** reports is not necessary.

9.20 Air Carriers That Elect Not To Apply This AC.

If it is appropriate for an operator to apply this AC and **FSB** provisions but the operator does not to do so, alternate approval is required as designated by **AFS-1**. If alternate means are approved, FAA makes conservative determinations regarding program time reductions, simulator equivalences for Part 121 Appendix H credit, LOFT credits, approval of use of contract training facilities or programs, proving run reductions, **IOE** surveillance, **AQP SFAR** approval, and other relevant FAR provisions. Air carriers must justify equivalence and may expect a minimum of credit for simulators and training devices when simulators or devices do not closely match each variant of aircraft operated by that air carrier. This is necessary to ensure that an adequate level of safety is maintained. If an air carrier does not choose to apply the provisions of this AC when applicable, principal inspectors should consult their FAA Region, the **AEG/FSB**, **NSET**, and **AFS-200** as appropriate. FAA response to non-compliance will be assessed on a case by case basis.

9.21 Air Carrier Mergers.

In addition to provisions described above, when mergers of FAR 121 air carriers occur which result in the integration of variants from the predecessor operators, certain additional coordination is appropriate. The **POI** of the surviving or newly designated operator should consult with the former **POI(s)** responsible for any **ODR** tables previously approved to assure proper integration of the new fleet. In addition, the **POI** responsible for the merged fleet should consult with the chairman of the responsible **FSB** to assure that any information available to the FAA **FSB** relative to variants of the proposed merged fleet may be considered before new **ODR** tables are approved.

10. APPLICATION OF REQUIREMENTS TO AIRMEN CERTIFICATION.

10.1 General.

In addition to master requirements the Flight Standardization Board (FSB) report contains specifications for administration of type rating or proficiency checks by FAA inspectors or air carrier check airmen. FAA airmen certification inspectors, air crew program managers (APM's), air carrier check airmen, air crew program designees (APD's), and designated pilot examiners (DPE's) should be familiar with FSB provisions regarding the proper administration of any necessary checks or evaluations for types or variants covered by the FSB report.

10.2 Checking Specifications.

FAA airmen certification inspectors and aircrew program managers should assure proper application and administration of checks required by FSB reports as constrained by the master difference requirements (MDR) and specific operator differences requirements (ODR) tables. FSB reports describe difference levels which constrain the various maneuvers, procedures, or unique factors to be considered by inspectors or check airmen when administering checks or observing initial operating experience (IOE). For example, certain non-normal procedures may be required and others may be waived (no flap landings). Other unique procedures or maneuvers particular to an aircraft type may be necessary. Any unique configurations or failure conditions that should be observed while administering checks are described.

10.3 Surveillance.

Continuing surveillance is appropriate to ensure maintenance of both checking and device standards. Enroute inspection surveillance should ensure comprehensive performance of the overall application of FSB training, checking, and currency standards. Devices to be used for difference level compliance are specified by FSB reports and approved ODR's. Inspectors, examiners, and check airmen have the responsibility to ensure that devices approved under ODR's continue to meet FSB or National Simulator Evaluation Team (NSET) criteria as appropriate. If the devices fail to meet criteria or other deficiencies are observed in approved programs, remedial actions are initiated through the principal inspector. For significant deficiencies, feedback to the AEG/FSB would be appropriate for reconsideration of FSB provisions.

10.4 Oral and Written Tests.

Unless otherwise approved through an AQP program when C, D, and E level checking is shown, an approved oral or written test must be satisfactorily completed unless otherwise approved through an AQP program. This is necessary to ensure flightcrew members' knowledge with respect to each aircraft variant

and crew position involved and to validate attainment of training objectives.

10.5 Checks Regarding Complex Systems.

10.5.1 Checking for differences related to certain complex systems (e.g., FMS), at or above level C, must include a demonstration of competency covering both an oral/written exam and demonstration of procedural proficiency. The actual demonstration of proficiency must be certified by an authorized check airman, examiner, or FAA aviation safety inspector. Certification of knowledge of a crewmember may be done during training, by completion of an exam using the procedure described in Section 121.401(c) of the FAR, or as otherwise approved for an AQP program.

10.5.2 Complex systems checks should include hands-on operation and ensure demonstrated procedural proficiency in each applicable mode or function. Specific items and flight phases to be checked are specified such as: initialization, takeoff, departure, cruise, arrival, precision and non-precision approach, and pertinent non-normals. Airman certification may be based on an approved program which incorporates a series of separate tests accomplished during the training program if that program is shown to be effective in assuring airman competency.

10.6 Proficiency Checks. Section 121.441 of the FAR or AQP Proficiency Evaluations.

10.6.1 Proficiency checks or proficiency evaluations are to be administered as designated in the Federal Aviation Regulations and be consistent with the FSB report and MDR's. Guidance on maneuvers and devices is provided in section 7 of FSB reports and example ODR. Checks may be administered by an FAA inspector, designated check airman, or as authorized for an AQP program. In the case of level C or less, the FAA may authorize other persons to conduct the necessary evaluations.

10.6.2 When Proficiency Checks (PC) involve level C or greater variants, portions of the PC must be accomplished in relevant combinations of devices, simulators, or aircraft. The devices used for portions of the PC are usually the same devices used for training and when necessary are identified in FSB reports.

10.6.3 Equipment examinations during a PC should address all variants being operated by the flightcrew member.

10.6.4 In certain instances it may be possible to satisfactorily accomplish recurrent checking objectives in a device that does not meet initial check requirements. If approved by the FSB and principal inspector, principal inspectors may permit certain portions of such recurring checks to be conducted in a device not meeting initial check requirements. However, the principal inspector, FAA inspectors, designated examiners, or check airmen, may require demonstration of competency in the initial level devices when

doubt exists regarding training program adequacy, an airman's preparation or competency, or it is otherwise determined necessary.

10.7 Operating Experience.

The FSB may determine that qualification in variants must include an additional minimum of IOE or supervised line flying (SLF) beyond that necessary for qualification in the type. Thus, FSB requirements should be applied for conduct of all IOE/SLF. Certain required operating experience identified as SLF must be obtained while serving in a flight crew position and include operation of the specified system. In such instances jumpseat observation does not apply. In cases specified by the FSB for this additional IOE, line-oriented flight training (LOFT), or line operational simulation (LOS) involving appropriately configured simulators may be used for IOE/SLF.

10.8 Recurrent Checking.

Unless otherwise identified by the MDR's footnotes, recurrent ground and flight training must include suitable checks when specified at or above level B. Such checks should assess knowledge and acceptable levels of skill and consider airplane variants and crew position.

11. TRAINING DEVICE AND SIMULATOR APPROVAL.

11.1 Training Device and Simulator Characteristics.

11.1.1 Minimum Device and Simulator Characteristics. Minimum acceptable characteristics and standards for flight training devices and simulators are described in AC 120-40A and AC 120-45. These standards are directly applied by the FSB in difference level specifications. When applicable, other device characteristics may also be specified by the FSB as the minimum acceptable for differences training, checking, or currency between certain variants. These characteristics are identified in the FSB report,

11.1.2 Coordination with the FAA National Simulator Program. When the FSB specifies device characteristics, the FSB coordinates with the National Simulator Evaluation Team (NSET) to ensure simulator criteria compatibility and approval process definition. If device or simulator characteristics have not been previously recognized by the FAA as meeting this AC, FSB, or NSET criteria, they must be evaluated by the NSET in consultation with the FSB prior to receiving credit in an approved differences program.

11.2 Aircraft/Simulator/Device Compatibility.

11.2.1 Devices and Simulators to Match Variants. When flightcrews fly variants in a mixed fleet, the combination of simulators and training devices used to satisfy MDR and ODR provisions must match specific variants of the aircraft flown by that operator, including use of leased training devices and simulators (Ref. Section 121.407 of the FAR). The acceptability of

differences between training devices, simulators, and aircraft operated must be addressed by the principal inspector, FSB, and NSP as appropriate. The FSB, PI, and when necessary, AFS-200, identify acceptable credit for simulators and training devices. Provisions for other approvals are described in 11.3 below.

11.2.2 Differences between Devices, Simulators, and Variants. When differences exist between variants and the proposed training devices or simulators to be used, then MDR's and ODR's may be used as guidance for acceptance and approval as is done between variants. The FSB, the NSP, and AFS-200 should be consulted when uncertainty exists regarding use of MDR's and ODR's for acceptance or approval of these devices. The FSB will not recommend use or approval of devices which significantly differ from actual aircraft operated.

11.3 Simulator and Device Approvals.

11.3.1 Criteria for Approval. Training device and simulator approval requests should be made in accordance with AC 120-40A, 120-40, or the AQP SFAR. If device characteristics clearly meet established FAA criteria and have been previously qualified by the NSET, or have been accepted by the FSB as meeting the intent of MDR's, the principal inspector may approve those devices for that carrier. The FSB will maintain records of its determinations regarding device compliance for specific difference levels for future reference. When proposed devices do not clearly satisfy a given level, advice should be requested from the FSB or NSP Manager.

11.3.2 NSET Representation to the FSB. In order to address designation of and approval processes for devices and simulators at C, D, and E Difference levels, a National Simulator Evaluation Team member serves as an advisor to the FSB or a member of the FSB.

11.3.3 Coordination of NSET Criteria with the FSB. National simulator team development of criteria for training devices and approval test guides (ATG's) for new or derivative aircraft are coordinated with the FSB. This ensures compatibility of FSB/NSET requirements and effective use of resources for development of ATG's and determination of FSB requirements.

12. APPROVAL AND RECONSIDERATION OF FAA DECISIONS.

12.1 FAA Approval of FSB Reports. FSB reports are approved as designated by AFS-1. In the event that revision of an FSB report is necessary, the FSB is provided with necessary policy guidance to implement applicable changes.

12.2 Applicants, Operators, or other Organizations Requesting Reconsideration of FSB Report Provisions. When there is disagreement with provisions of an approved FSB report, that disagreement may be expressed to the FSB chairman for the pertinent aircraft type. In the event an issue cannot be resolved, the issue may then be addressed to the Air Transportation Division, AFS-200.

Additional information, data, or analysis may be provided to support differing views regarding the FSB provisions in question.

13. OTHER MEANS OF COMPLIANCE.

13.1 Alternate Compliance. This AC and FSB reports describe a standard means, but not the only means, of compliance with requirements for Part 121 Subpart N and O and certain provisions of the AQP SFAR. Even though an FSB report is published in accordance with this AC, alternate means of compliance are considered by FAA. However, alternate means must provide an equivalent level of safety, be compatible with other Federal Aviation Regulations, and be approved as designated by AFS-1.

13.2 Equivalence Must be Demonstrated. If an alternate means of compliance is sought, operators, manufacturers, or modifiers will be required to establish that each proposed alternate means provides an equivalent level of safety to the provisions of this AC and pertinent FSB reports. Analysis, demonstrations, proof of concept testing, differences documentation, or other evidence may be required. Such approvals are made on a case by case basis. When a significantly different approach is proposed by a manufacturer or operator, proof of concept evaluation is required. This is appropriate to establish both the effectiveness of evaluation methods and the level of safety provided by the alternate means. The FAA and applicant must agree on any proof of concept evaluation used to establish the acceptability of a different concept or means of compliance. When the FAA authorizes methods other than specified by this AC, related air carrier, military, foreign or other experience, accident or incident history, and other factors are considered.

13.3 Additional Limitations May Be Necessary. When an operator does not elect to apply the provisions and techniques of this AC, any credit for qualification in variant (s) will, be conservatively considered. Training program reductions, simulator and device approvals, and check simplification by maneuver waivers may be significantly limited to ensure an equivalent level of safety and reporting requirements may need to be increased. Should a manufacturer or modifier not apply this AC for a new type or variants, the FAA will make appropriate conservative judgments for requirements applicable to that type or variant. This includes designation of a type rating and specification of training, checking, and currency program requirements for the aircraft or variants.

13.4 Lead Time. FAA will generally not consider relief through alternate compliance means unless sufficient lead time has been planned to allow for any necessary testing and evaluation. When clearly unforeseen circumstances make it impossible to develop, apply, or comply with FSB provisions in a timely manner, the applicant may seek interim equivalent programs rather than a permanent alternate compliance method. Financial arrangements, schedule adjustment, and other non-operational reasons are not considered appropriate justification for temporary provisions.

5/13/91

AC 120-53
Appendix 1

ATTACHMENT 1 - FSB REPORT CONTENTS

FSB REPORT PART = TRAINING, CHECKING, CURRENCY, AND OTHER REQUIREMENTS

(Part I contains requirements for application
by FAA field offices and Part 121 operators.)

1. PURPOSE AND APPLICABILITY
 2. PILOT "TYPE RATING" REQUIREMENTS
 3. "MASTER COMMON REQUIREMENTS" (MCR's)
 4. "MASTER DIFFERENCE REQUIREMENTS" (MDR's)
 5. ACCEPTABLE "OPERATOR DIFFERENCE REQUIREMENTS" TABLES
 6. FSB SPECIFICATIONS FOR TRAINING
 7. FSB SPECIFICATIONS FOR CHECKING
 8. FSB SPECIFICATIONS FOR CURRENCY
 9. AIRCRAFT REGULATORY COMPLIANCE CHECKLIST
 10. FSB SPECIFICATIONS FOR DEVICES AND SIMULATORS
 11. APPLICATION OF FSB REPORT
 12. ALTERNATE MEANS OF COMPLIANCE
 13. MISCELLANEOUS
- APPENDIX 1 - MDR TABLE
- APPENDIX 2 - ACCEPTABLE ODR TABLES
- APPENDIX 3 - ACCEPTABLE TRAINING PROGRAM EXAMPLE
- APPENDIX 4 - COMPLIANCE CHECKLIST

ATTACHMENT 1 (CONT)

FSB REPORT PART II - BOARD RECORD

(Part II is retained within FAA as a permanent
record of **FSB** evaluations and determinations)

1.0 BACKGROUND

2.0 **FSB** COMPOSITION

3.0 APPLICANTS PROPOSAL AND FAA ISSUE PAPERS

4.0 TYPE RATING AND CREW QUALIFICATION TESTS, AND **FSB**
DETERMINATIONS

5.0 PUBLIC MEETING RECORD AND RESOLUTION OF COMMENTS

6.0 SUMMARY AND CONCLUSIONS

7.0 ATTACHMENTS (Examples)

Attachment 1 - Applicants proposal

Attachment 2 - Issue Papers

Attachment 3 - Public Meeting Record/Availability

Attachment 4 - Comments submitted

Attachment 5 - Tests Used

Attachment 6 - Test **LOF** Scenarios

ATTACHMENT 2

MASTER DIFFERENCE REQUIREMENTS TABLE - EXAMPLE

The following MDR table is an example of a hypothetical aircraft type with five variants. The type (identified as a VAR) is shown to have five different variants identified as a V-100 through V-500. Each variant is assumed to have uniformly increasing differences from a V-100, and the degree of difference between each is equal. The difference level requirements between variants reflect increasing differences from a V-100 to the V-500. At some point in the derivative aircraft's evolution, level E is assumed to have been assigned as a result of FSB evaluation and tests. Because level E is required, a different type rating (VAR-5) is identified for the V-500 and subsequent variants. Difference level requirements for operators who fly V-100's and V-500's are E/E/E. However operators who only fly V-400's and V-500's must meet B/B/B. This is appropriate because few differences exist between the V-400 and V-500 even though each has a separate type rating. Crews who fly only V-400 and V-500 variants may receive extensive credit for common training, checking, and currency between the variants. When completing differences qualification between a V-400 and V-500, crews may receive the other respective type rating as a result of satisfactory completion of a level B/B/B program as specified by the applicable FSB report.


5/13/91


MASTER DIFFERENCE REQTS (MDR) TABLE (GENERIC FORMAT)

VAR = V-100, V-200, V-300, V-400 VAR-5 = VAR-500, ...

		BASE AIRCRAFT (FROM)					
		V-100	V-200	V-300	V-400	V-500	...
T O A I R C R A F T	V-100	A/A/A	B/B/B	C/C/C	D/D/D	E/E/E	E/E/E
	V-200	B/B/B	A/A/A	B/B/B	C/C/C	D/D/D	E/E/E
	V-300	C/C/C	B/B/B	A/A/A	B/B/B	C/C/C	D/D/D
	V-400	D/D/D	C/C/C	B/B/B	A/A/A	B/B/B	C/C/C
	V-500	E/E/E	D/D/D	C/C/C	B/B/B	A/A/A	B/B/B
	...	E/E/E	E/E/E	D/D/D	C/C/C	B/B/B	A/A/A

TYPE RATINGS

VAR 

VAR-5 

OPERATOR PQR: V-100, V-500 REQUIREMENTS

OPERATOR XYZ: V-400, V-500 REQUIREMENTS

FIGURE A2-1

5/13/91

AC 120- 53
Appendix 1

ATTACHMENT 3

OPERATOR DIFFERENCE REQUIREMENTS TABLE - EXAMPLE

Operator difference requirements (**ODR**) tables are prepared by the operator based on the FAA's master differences requirements (**MDR's**) table. The **ODR** tables are operator and aircraft specific and are maintained to represent the operator's specific fleet of aircraft and compliance methods. **ODR** tables address differences within that fleet for any crews that are conducting mixed fleet flying or that are seeking credit in initial or transition programs.

Example **ODR** tables for several variants of the **B737** follow as figures **A3-1** through **A3-9**.

737-200 TO 737-300 DESIGN OPERATOR DIFFERENCES REQUIREMENTS TABLE

DESIGN OPERATOR DIFFERENCES REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 737-300 BASE AIRCRAFT: 737-200 ADVANCED APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
DESIGN FEATURE	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR
AIRPLANE CONFIGURATION	<ul style="list-style-type: none"> BODY EXTENSION 104 " WING TIP EXTENSION 14" DORSAL FIN 	NO	NO		AVT/SU			B
PANEL LAYOUT	<ul style="list-style-type: none"> ADDITION OF FMC/AFDS/AT/IRS ETC. 	NO	NO		AVT/SU			
WEIGHTS	<ul style="list-style-type: none"> GROWTH RELATED CHANGES 	NO	NO		AVT/SU			
POWER PLANT	<ul style="list-style-type: none"> PLACEMENT 	MIN-OR	NO		AVT/SU			

FIGURE A3-1

737-200 TO 737-300 SYSTEM OPERATOR DIFFERENCES REQUIREMENTS TABLE

SYSTEMS OPERATOR DIFFERENCES REQUIREMENTS TABLE									
DIFFERENCE AIRCRAFT: 737-300 BASE AIRCRAFT: 737-200 ADVANCED APPROVED BY (POI):					COMPLIANCE METHOD				
					TRAINING			CHKG/CURR	
SYSTEM	REMARKS	EUT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR	
21 AIR COND. & PRESSURIZA- TION	- RECIRC FAN REPLACES GASPER FAN - 3 POSITION PACK SWITCH - FWD OUTFLOW VALVE LIGHT DELETED - EQUIPMENT COOLING FAN LIGHT - ADDITIONAL FAN INSTALLED (EFIS ONLY) - DISTRIBUTION: MINOR CHANGES	NO	YES		AVT/ SU				
22 AUTOFLIGHT	- SP-300 AFDS REPLACES SP-77/SP-177 - AUTOTHROTTLE ADDED* - AUTOLAND CAPABILITY ADDED* (*ONLY WHEN COMPARED TO SP-77 AIRPLANES) - LNAV/VNAV - TO/GA MODE	NO	YES		AVT	CBT/ FMS/ AT	C*+OE	D 90 DAYS + 3 FLT SEG.	
24 ELECTRICAL	- MINOR CHANGES IN POWER DIST.	NO	NO		AVT/ SU				
25 EMERGENCY EQUIPMENT	- CANNISTER OPTION ONLY* - NEW CREW MASKS* (*OPTION ON SOME -200 AIRPLANES)	NO	YES		AVT/ SU				
26 FIRE PROTECTION	- DUAL-LOOP DETECTION SYSTEM - MINOR EXTNG. EQUIP. CONFIG CHANGE - TWO SQUIBS PER BOTTLE	NO	YES		AVT/ SU				

FIGURE A3-2

737-200 TO 737-300 SYSTEM OPERATOR DIFFERENCES REQUIREMENTS TABLE
[continued]

SYSTEMS OPERATOR DIFFERENCES REQUIREMENTS TABLE									
DIFFERENCE AIRCRAFT: 737-300 BASE AIRCRAFT: 737-200 ADVANCED APPROVED BY (POD): _____									
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	COMPLIANCE METHOD				CHKG/CURR	
				LVL A	LVL B	LVL C	FLT CHK	CURR	
27 FLIGHT CONTROLS	- ADD'L SPOILERS ADDED - ELECTRIC AIL TRIM - DUAL CHANNEL MACH TRIM; TEST BUTTON DELETED - SPEED TRIM ADDED - STAB TRIM BRAKE DELETED - TWO SPEED STAB TRIM - DIFFERENT STAB TRIM RANGE - ELECTRIC STAB TRIM OVERRIDE - ELECTRIC RUDDER TRIM - AUTOSLAT SYS. ADDED - TE FLAP PLACARD SPEEDS - CERTIFIED T/O FLAP SETTINGS	MIN- OR	YES		AVT/ SU				
31 FLIGHT INSTRUMENTS	- EFIS (AS INSTALLED) - ADI/HSI (AS INSTALLED) - NAV SWITCH (AS INSTALLED)	NO	YES		AVT/ SU				
28 FUEL	- CONTINUOUS FUEL HEAT; SWITCHES DELETED - FILTER BYPASS LIGHT REPLACES ICING LIGHT - FUEL CAPACITY INCREASED - GND XFER OF FUEL - AUX TANK (OPTIONAL)	NO	YES		AVT/ SU				

FIGURE A3-3

737-200 TO 737-300 SYSTEM OPERATOR DIFFERENCES REQUIREMENTS TABLE
[continued]

SYSTEMS OPERATOR DIFFERENCES REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 737-300 BASE AIRCRAFT: 737-200 ADVANCED APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR
29 HYDRAULIC	<ul style="list-style-type: none"> - LANDING GEAR XFER UNIT - SYS A & B SOURCES AND COMPONENTS CHANGED; A & B INDEPENDENT - GROUND INTERCONNECT DELETED - AUTOSLAT PTU - THRUST REVERSER- ONE ON EACH SYS - B QUANTITY GAUGE ADDED 	NO	YES		AVT/ SU			
30 ICE & RAIN PROTECTION	<ul style="list-style-type: none"> - ENG INLET ANTI-ICE DELETED - WING ANTI-ICE OPERATION ON GROUND PERMITTED' (*OPTION ON SOME -200 AIRPLANES) 	NO	YES		AVT/ SU			
32 LANDING GEAR	<ul style="list-style-type: none"> - NORM/ALT REPLACES A & B SYS BRAKES - PAIRED WHEEL ANTI-SKID PROTECTION ON ALT BRAKES - TIRE SCREEN DELETED* - NO TOUCHDOWN OR LOCKED WHEEL PROTECTION ON ALT BRAKES - SINGLE ANTI-SKID SWITCH (* OPTION ON SOME -200 AIRPLANES) 	NO	NO		AVT/ SU			
34 NAVIGATION	<ul style="list-style-type: none"> - FMCS ADDED - IRS ADDED - ANCDU 	NO	YES		AVT	CBT/ FMS/ AT	C* + OE	D 90 DAYS + 3 FLT SEG.

FIGURE A3-4

737-200 TO 737-300 SYSTEM OPERATOR DIFFERENCES REQUIREMENTS TABLE
[continued]

SYSTEMS OPERATOR DIFFERENCES REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 737-300 BASE AIRCRAFT: 737-200 ADVANCED APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR
36 PNEUMATICS	- DISRIBUTION MINOR CHANGE	NO	NO		AVT/ SU			
73, 74, 77, 80 POWER PLANT	- CFM-56 ENGINES - NEW INDICATORS - CASCADING VANES TYPE REVERSER WITH AUTO RESTOW - PMC ADDED - IGN SELECT SWITCH	NO	YES		AVT/ SU			B
33 WARNING	- ADD'L SYS ANNUNCIATOR LIGHTS ADDED - GPWS MODE 6 WINDSHEAR OPTION* (* OPTION ON SOME -200 AIRPLANES)	NO	YES		AVT/ SU			
WINDSHEAR EQUIPMENT	- AUTOMATIC RECOVERY AVAILABLE IF IN DUAL CHANNEL - FLIGHT DIRECTOR GUIDANCE AVAILABLE (OPTIONAL)	NO	YES		AVT/ SU	FMS/ AT	C*	
PERFORMANCE	- CHANGED	MIN- OR	NO		AVT/ SU			
LIMITATIONS	- GROWTH RELATED CHANGES	NO	NO		AVT/ SU			B

FIGURE A3-5

5/13/91

AC 120-53
Appendix 1

737-200 TO 737-300 MANEUVER OPERATOR DIFFERENCES REQUIREMENTS TABLE

MANEUVER OPERATOR DIFFERENCES REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 737-300 BASE AIRCRAFT: 737-200 ADVANCED APPROVED BY (POD): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
MANEUVER	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR
NORMAL TAKEOFF, CLIMB, CRUISE, DESCENT, INSTRUMENT APPROACHES, LANDING	- OPTIONAL USE OF AFDS, & A/T (ALSO AN OPTION FOR -200 AFCS AIRPLANES) - OPTIONAL USE OF FMCS	NO	SEE APP		AVT/ SU	FMS/ AT	C* + OE	D 90 DAYS + 3 FLT SEG.
NON-NORMAL MANEUVERS	- OPTIONAL USE OF AFDS, & A/T (ALSO AN OPTION FOR -200 AFCS AIRPLANES) - OPTIONAL USE OF FMCS	NO	SEE APP.		AVT/ SU	FMS/ AT	C*	

FIGURE A3-6

737-300 TO 737-400 DESIGN OPERATOR DIFFERENCE REQUIREMENTS TABLE

DESIGN OPERATOR DIFFERENCES REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 737-400 BASE AIRCRAFT: 737-300 APPROVED BY (POI)				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
DESIGN FEATURE	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR
CONFIGURATION	<ul style="list-style-type: none"> BODY LENGTHENED TAIL SKID TWO OVERWING EXITS ADDED 	NO	NO	TNG HND-OUTS				
WEIGHT	<ul style="list-style-type: none"> INCREASED WEIGHTS REQUIRES NEW FLAP SPEED SCHEDULE; 10 KNOTS ADDED TO ALL FLAP SPEEDS WITH GW ABOVE 138,500 FOR TAKEOFF OR LANDING 	NO	YES	TNG HND-OUTS				B

FIGURE A3-7

737-300 TO 737-400 SYSTEMS OPERATOR DIFFERENCE REQUIREMENTS TABLE

SYSTEMS OPERATOR DIFFERENCES REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 737-400 BASE AIRCRAFT: 737-300 APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR
21 AIR COND. & PRESSURIZA- TION	- 3 ZONE AIR CONDITIONING SYS. - REVISED CONTROLS AND INDICATORS - TRIM AIR	NO	SEE APP.	TNG HND- OUT				
22 AUTOFLIGHT	- REVISED DISENGAGE BAR - TO/GA MODE NOW AVAILABLE WITH BOTH F/D SWITCHES OFF	NO	NO	TNG HND- OUT				
24 ELECTRICAL	- HIGHER GENERATOR RATINGS	NO	NO	TNG HND- OUT				
27 FLIGHT CONTROLS	- INCREASED FLAP PLACARD SPEEDS	NO	NO	TNG HND- OUT				
34 NAVIGATION	- FMCS UPDATE 4; SEVERAL NEW CDU PAGES WITH ADDED INFO/ FEATURES	NO	NO	TNG HND- OUT				
LIMITATIONS	- GROWTH I RELATED CHANGES	NO	NO	TNG HND- OUT				B

737-300 TO 737-400 MANEUVER OPERATOR DIFFERENCE REQUIREMENTS TABLE

MANEUVER OPERATOR DIFFERENCES REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 737-400 BASE AIRCRAFT: 737-300 APPROVED BY (POI) _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
MANEUVER	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FLT CHK	CURR
PREFLIGHT INSPECTION	- EXT. INSPECTION CHANGED TO ADD TAILSKID - INT INSPECTION CHANGED TO ADD EXTRA OVERWING EXITS	NO	SEE API?	TNG HND-OUT				
TAKEOFF NORMAL	- FLAPS ONE NOT CERTIFIED FOR T/O	NO	NO	TNG HND-OUT				

FIGURE A3-9

ATTACHMENT 4-

TYPE RATING AND DIFFERENCE LEVEL TESTS - PLANNING AND APPLICATION

SECTION 1. Preparation.

1.1. The type rating, difference level definition, and test process are initiated when a manufacturer or modifier presents an aircraft for type certification as a "new type," "derivative" of an existing type, or for a type rating "common" with an existing type. If the manufacturer presents an aircraft as a new type, then type rating and training program requirements are analyzed as previously established, except that T5 is now formally used as the means to set FAR Part 121 required training, checking and currency standards as applicable to that type. For aircraft in which a common type rating is sought, the process described below, primarily using T1, is applied. Special "common type" cases may occur where T2, T3, or T4 are needed. Details of these situations require further amplification and are provided in the AC/Appendix itself. If the manufacturer proposes a derivative aircraft, the following process applies starting with T1. In any event, type rating and crew qualification requirements must be set prior to TC/STC and before an aircraft enters Part 121 service.

1.2. To begin the evaluation process, the manufacturer or modifier identifies models and general variations of models existing in that particular fleet. The model variants are then assigned to logical groups to be described in MDR tables and the FSB report.

1.3. Major differences pertinent to the various models are identified and comparisons are made with the proposed new model. These differences are summarized in a differences document which include appropriate sample operator difference requirements (ODR) tables. Since combinations of all approved model configurations may be numerous, some combinations will never actually be flown, and only typical differences are needed at this stage for test definition, the applicant may select representative ODR for preparation. Similar models are then included in the groups as noted in paragraph 1.2 above for analysis and testing to set the MDR table and FSB requirements.

1.4. Based on the above analysis (including preliminary flight test results or flight simulation estimates if available), the manufacturer proposes probable "difference levels" to be specified in each "cell" of the master difference requirements table for the various model pairs.

1.5. The manufacturer proposes applicable elements of the test process (T1 - T5) and a plan for validation of the intended difference levels. Specific aircraft, times, devices, etc. are identified to conduct the required tests for the pertinent model pairs. Included in the proposal are any necessary interpretations of expected results using advisory circular or established

practical test standards (PTS). Any special, unique, or additional definitions of successful outcomes are also identified.

1.6. The scope of T1 - T5 is keyed to basic VFR and IFR operations in the NAS. For IFR operations, consideration is given and standard operating procedures apply in cases such as takeoff noise abatement procedures, SIDs, STARS, ILS, VOR, and NDB approaches. Routine "line" situations of inoperative equipment, operations in various types and densities of airspace, adverse weather, etc., are incorporated. However, investigation of special or unique systems or operations such as oceanic navigation in minimum navigation performance specifications (MNPS) airspace, extended range operations (EROP), or category III, are considered only to the extent that crews demonstrate proper basic operation of systems which are integral to the overall operation of the aircraft (e.g., alignment of inertial reference unit (IRU), programming of flight management system (FMS), correct use of the automated flight control system" (AFCS) including autoland, interpretation of electronic centralized aircraft monitoring (ECAM), engine indicating and crew alerting system (EICAS), or other types of annunciation, etc.). Any of the above special or unique issues may, when appropriate, be incorporated in MDR tables, footnotes, or ODR example tables when consistent with pretest applicant/FAA agreement. Although MDR/FSB evaluation may not in certain cases specifically include certain differences (e.g., HF radio), individual air carrier ODR's for particular aircraft will identify, evaluate, and address compliance for these items.

1.7. FAA/manufacturer agreement is reached on the grouping of models, proposed tests, test plans, schedules, subjects, and interpretation of possible outcomes.

1.8. Test subjects for all tests except for "extended T3" (if extended T3 is needed) are drawn from the FAA FSB. Subject selection considers the factors such as follows:

- (a) Needed background skills of candidates (previously qualified types);
- (b) General flight experience and currency;
- (c) Test requirements such as location, short notice access, and skills needed for subjects;
- (d) Technical areas, qualifications, or experience that subjects should not have in order to avoid test prejudice;
- (e) Eventual FAA geographic or operator related distribution requirements for ACI, APM, and principal inspector personnel;
- If) Other special experience as needed for a particular program.

Subject qualifications are addressed at the time of test specification when

test agreement is reached with the applicant.

1.9 Flight Test Branch Coordination. During preparation for testing and evaluation of results, appropriate Aircraft Certification Flight Test Branch coordination is accomplished so that flight characteristics issues and, in particular, special flight characteristics can be suitably identified and addressed.

SECTION 2. Functional Equivalence - Level A or B - TEST 1 (T1)

2.1 T1 is conducted to establish that two variations of the same type aircraft are functionally equivalent and may be assigned difference level A or B. The test is also the first test performed if the manufacturer is seeking a "common type rating." If analysis shows that the differences between aircraft are relatively minor and level B at most can cover difference training, checking, or currency requirements, test **T1** is appropriate. If differences are projected to be major, requiring level C, D, or E, **T1** may be waived and **T2** and **T3** directly applied. In this event the FAA must agree to the waiver of **T1**, and the applicant must agree that the aircraft pair will at least be classed as a level C or higher.

2.2 T1 is typically conducted using two groups of test subjects. Each group is trained in one aircraft, given a "no jeopardy" test to establish a baseline on their primary aircraft, and then they are given a similar "no jeopardy" test on the other aircraft. The symmetry of the test, from a subject sample size and base aircraft qualification point of view, is determined by the particular test to be administered. Symmetry and sample size may vary depending on information already known, expected outcome of the test, criticality of the test, or anticipated need for consideration of that pair of aircraft in the MDR's.

2.3 The test consists of a Part 61, Appendix A type rating flight test or Part 121, Appendix F proficiency check. A subset of **FSB** members review the candidate test to be administered to be sure it examines critical aspects of the pertinent aircraft pairs. The tests may be administered or observed by more than one **FSB** member to ensure consistency and uniformity of test procedures and common understanding of subject performance and outcomes.

2.4 For **T1** a "safety pilot," serving as first officer for the test, may intervene to prevent damage to the aircraft or to limit maneuvers which endanger safety of flight.

2.5 Test outcomes are documented by maneuver or procedure including successes, problems, and failures.

2.6 Subjects for **T1** are chosen from FAA **FSB** members. Outcomes of **T1** are decided by **FSB** members and are consistent with previously agreed upon criteria.

2.7 If both groups of subjects clearly pass, the pertinent aircraft pairs may be assigned level A or level B.

2.8 If either group of subjects clearly fail the test, level A or B may not be assigned for that particular aircraft model pair. T2, and if appropriate T3, are then conducted for that pair.

2.9 When T1 is passed a level A or B determination is made. If issues warrant training beyond level A described below, then level B is assigned. The FSB determines the areas of differences training required and specifies necessary devices or training limitations.

2.10 Use of level A is limited to situations where the knowledge requirement is such that understanding and compliance can be assumed to take place. Level A is accordingly limited to situations such as the following:

(a) The change introduces a different version of a system/component for which the flightcrew has already shown the ability to understand and use (e.g., an updated version of an engine);

(b) The change results in minor or no procedural changes and does not result in adverse safety effects if the information is not reviewed or is forgotten (e.g., a different vibration damping engine mount is installed, expect more vibration in descent; logo lights are installed, use is optional);

(c) Information which highlights a difference which once called to the attention of a crew is self-evident, inherently obvious, and easily accommodated (e.g., different location of a communication radio panel, a different EGT limit which is placarded, or changes to non-normal "read and do" procedures).

2.11 Differences which cannot be accommodated by one of the above categories as an upper limit are assigned level B. Typically for level B, the differences information is more complex or it may require a more formal means to assure standardization. Additional considerations for level B may be the need to assure attention, understanding, or emphasis, during training, or retention after training. Level B training is achieved by aided instruction such as use of slide tape presentations, CBT training, or other similar techniques.

SECTION3. Handling Qualities Comparison - TEST 2 (T2)

3.1 T2 identifies handling quality differences that warrant use of advanced simulation (phase II/III simulators) or aircraft training. It considers needed motion cues, critical visual cues, and significant differences in handling characteristics that potentially affect training, checking, or currency or devices needed in their accomplishment.

3.2 Passing T2 is interpreted as meaning that the "base aircraft" and

*subject aircraft" are sufficiently similar in handling characteristics so that separate aircraft or advanced simulator training, checking, or currency are not needed with respect to handling.

3.3 Failure of T2 means that handling differences are great enough that separate advanced simulation or aircraft training or checkings required for certain pairs of models tested. Accordingly, level E is applied, and the FAA assigns a separate pilot type rating for pertinent models within the fleet.

3.4 A partial test success may result in a requirement that only certain maneuvers be done in the same advanced simulator or the aircraft.

3.5 The procedure for application of T2 is as follows:

(a) The manufacturer or modifier analyzes design or system differences which could affect handling qualities. A comparison is made of available flight or simulation test data to make a preliminary estimate of the outcome of and need for T2;

(b) The proposed model is then compared with existing aircraft simulator approval test guides (ATG's) or flight test data, and differences are noted:

(c) From this list differences which could affect handling characteristics, motion cues or visual cues are identified:

(d) The resulting handling quality related events, maneuvers, or conditions which could require training, checking, or currency in either an aircraft or simulator are identified.

3.6 If the analysis shows T2 is very unlikely to be failed, then T2 may be incorporated, with FAA agreement, in T3 for purposes of verification that an advanced simulator or aircraft training is not needed to address handling qualities.

3.7 In T2, subjects trained only in their "base aircraft" fly the other aircraft under the supervision of a trained safety pilot. The safety pilot can only provide assistance to the subject pilot in areas unrelated to the handling qualities determination. For example, the safety pilot can remove impediments to progression of the test but cannot fly, coach, or train the subject on any aspect of the test related to handling, vision cues, or motion cues.

3.8 The safety pilot may:

(a) perform all routine pilot-not-flying (PNF) duties:

(b) may set up or adjust systems including those normally operated by the pilot-flying (PF) in accordance with pretest agreements:

- (c) may address or resolve procedural impediments;
- (d) manage and satisfy checklists;
- (e) make normal call outs.

3.9 The safety pilot may not:

- (a) actuate primary flight controls during the evaluation;
- (b) instruct, lead, or coach test subject in any manner;
- (c) describe or interpret instrument indications in a manner which is perceived as coaching.

3.10 Prior training of subjects in the variant under evaluation is not permitted. Subjects will be given a flight check in their "base aircraft" initially to calibrate performance prior to taking the pertinent "check" in the variant being evaluated. Special provisions may be required when primary flight instrument symbology or concepts alone could mask proper evaluation of similarities or differences in handling characteristics.

3.11 The T2 process is the same as described in section 2 above. T2 is typically conducted using two groups of FAA subject pilots. Each group is trained on one aircraft only, given a 'no jeopardy' check to establish a baseline on their primary aircraft, and then given a similar 'no jeopardy' check in the other aircraft.

3.12 The symmetry of the check from a subject sample size and base aircraft qualification point of view is determined by the particular tasks or maneuvers to be evaluated. Symmetry and sample size may vary depending on information already known, expected outcome of the evaluation, criticality of the task, or anticipated need for consideration of that pair of aircraft in the MDR's.

3.13 The evaluation consists of relevant parts of a Part 61, Appendix A, type rating flight check or Part 121, Appendix F proficiency check. A subset of FSB members review the required maneuvers to be evaluated to be sure they examine critical handling quality aspects of the pertinent aircraft pairs. Subject pilots will be evaluated on performance of required maneuvers consistent with practical test standards (PTS), as well as a qualitative assessment of ease or difficulty of performance of maneuvers compared with the base aircraft. A comparison to the base aircraft will be made for each required maneuver. Subject pilots for T2 are selected from FSB members.

3.14 The evaluation is observed by more than one FSB member to ensure consistency and uniformity of procedure and assessment of outcomes.

3.15 If T2 is failed, level E applies, and flight training must be conducted in the aircraft, a different advanced simulator, or an advanced simulator that

can model the handling and systems of each respective model. With a T2 failure, the next step in the testing process is T5, to validate level E program requirements and training footprints. T3 is not appropriate, and levels C or D may not be assigned.

4.1 T3 is a systems differences test which has multiple functions. T3 identifies master difference requirements (MDR's) at C and D levels, validates training profiles, methods, devices, and checking necessary or appropriate at level C or D. In certain critical failure cases T3 can lead to assignment of level E and a separate type rating (see paragraph 4.10). T3 is used only when the equivalent handling test (T2) has been successfully completed or when T2 is being incorporated as part of T3. T3 (and similar T5) is fundamentally different than T1 and T2 in that proposed or typical training is permitted prior to conducting the test. Training is based on methods, times, devices, and footprints to be designated as the minimum when later specified in the MDR table. In T1 and T2, training is not appropriate or permitted, but in T3 training is integral to the test. T3 training footprints should provide for adequate training, considering typical experience of Part 121 crews, and need not compensate for or assume air carrier entry level skills. Conversely, T3 training should not require unusual or extraordinary skills or efforts of subjects to augment or compensate for minimum training in order to pass T3.

4.2 T3 is a two-part test consisting of:

(a) A Part 61, Appendix A ATPC type rating check: Part 121, Appendix F proficiency check; partial proficiency check; or proposed system check administered to subjects in the test aircraft. The check is administered assuming currency in the base aircraft and completion of the proposed training in the differences aircraft. If a full check is proposed, the tests are similar to those used for T1 or T2 as described in section 2 above. If a partial check is used, the process is similar, but the test items are determined by the FSB considering or based on manufacturer and/or air carrier proposals.

(b) A line oriented flying (LOF) test is then conducted to verify that the difference aircraft can be safely operated in a line environment and to evaluate application of the proposed training and checking in typical line scenarios and operations. The LOF may focus on special situations particular to certain model pairs, verification of overall adequacy of training or checking, the potential of negative transfer from one model to another, or unique fleet related issues.

4.2.1 LOF may also consider scenarios where crews potentially could make subtle or inadvertent errors that could place either the base or difference aircraft in jeopardy. For this analysis or evaluation, recall as well as less time dependent written procedures are considered.

4.2.2 In developing and selecting scenarios for evaluation the following are considered: likelihood of occurrence, possible consequences, and opportunity .

for crew discovery and correction are considered.

4.2.3 LOF may be done in an aircraft, in a simulator, or both per pretest agreement. LOF in some instances may require actual demonstration of mixed fleet flying by alternating between base and differences aircraft.

4.2.4 The LOF portion of the test may be used to evaluate complex issues or issues that cannot be fully detailed in a brief flight check since a check only samples crew knowledge and skills in a limited and highly structured environment. LOF is an integral part of T3 and must be successfully completed prior to "initial" assignment of difference levels (extended T3, if used, need only be completed prior to final level approval).

4.4 As in T1 and T2, subjects for T3 are chosen from the FAA FSB. Following completion of LOF and setting of the initial MDR's at the time of TC/STC, an expended T3 process may be proposed. This is done to get additional line experience and level verification. If an extended T3 phase is used, certain non-FAA pilots (from the manufacturer or air carriers) may be included in order to get a larger statistical sample for assessing training, checking, or currency levels and device effectiveness. When non-FAA personnel are included as subjects in an extended T3 process, the FAA and applicant must agree on subject group composition before the test. Checks in the extended T3 process are administered by FAA FSB members. Non-FAA pilot participation is limited to serving as a subject for extended T3 checks or serving as an extended T3 LOF subject.

4.5 Non-FAA subjects are only included in an extended T3 process following initial approval of differences levels by the FSB and during the period when air carriers implement their individual programs. During this phase FSB representatives observe crew performance during training, administer a sampling of checks, and observe line performance. Information from this phase is considered during the first FSB meeting following TC, usually occurring six months later when final levels are set.

4.6 Outcomes of T3 and extended T3 are decided by FSB members, consistent with previously agreed upon criteria. FAA practical test standards form the basis for T3 evaluation criteria.

4.7 A successful outcome of T3 includes passing all or a previously agreed upon sample of checks and completion of LOF with appropriate crew performance.

4.8 Failure of T3 occurs with either failure of a series of checks or a pre-agreed critical check, or unsatisfactory performance during the LOF portion of the test. In the event of a failure, more comprehensive programs may be proposed and retested within the same level or at a higher training or checking level. Additional devices may be proposed or time increases made to proposed differences level. In the case of retesting, new subjects may be required if program effectiveness cannot be established with subjects who already have been partially trained at the failed level.

4.9 When the test outcome is satisfactory, the **FSB** sets the minimum difference level at level C or D as appropriate. Documentation for the difference level specified may include training objectives, methods, minimum devices considered acceptable, times, training footprints, checks or currency constraints.

4.10 During **T3** level D tests, certain critical situations, problems, or failures may require assignment of level E rather than level D. Assignment of level E may be required in the event of:

(a) **T3** experience or difficulties which show the need for assignment of training levels approaching typical initial/transition levels, or

(b) **T3** crew performance which indicates that devices or methods associated with level D are not adequate to achieve training or checking objectives, or

(c) repeated failures of attempts to pass test 3 at level D.

4.10.1 Repeated failure at level D refers to failures of **T3** due to one or more subject's inadequate knowledge, skill, or ability due to variant differences or the limited success of training programs or devices, rather than individual subject failure due to sub-par or atypical personal performance. Sequential increases of training times, footprints, or other program requirements due to failures, to a value approaching typical initial or transition qualification levels, or marginal or uncertain performance of subjects following programs proposed at or slightly less than initial/transition levels may also require level E. Values slightly less than or approaching typical initial transition levels are decided before **T3** starts, on a case by case basis, using some appropriate criteria or measure suited to the applicant's proposed program (academic subjects, maneuvers, times, simulator periods, student behavioral objectives (**SBO**), crew performance objectives (**CPO**), etc.). In cases of marginal performance or where test failures show the need for training using a high fidelity environment (phase II/III simulation) to attain program objectives, then the **FSB** may assign level E.

4.11 The threshold for assignment of level E in the above situations depends on the nature of the failure or limitations encountered in **T3** and is not keyed or triggered by a checking or currency requirement alone. Contingencies related to paragraph **4.10** above should be assessed by the applicant and agreement reached on appropriate interpretation of possible failures prior to **T3**.

SECTION 5. Currency Validation - TEST 4 (T4) - (Done as needed.)

5.1 Currency requirements are conservatively set by the **FSB** using best judgement based on **T1**, **T2**, or **T3** outcomes. In the context of the AC appendix.,

currency addresses both the regulatory requirements referenced in Part 121 and extends the currency concept to include difference level specification of particular currency needed between variant aircraft. Currency limits of times, cycles, flights, legs, or other parameters may be set by the FSB for systems, procedures, or maneuvers.

5.2 Further various means to assure currency are permitted including operators recording and tracking individual crewmember performance of the currency items, construction of bid lines to assure that each crewmember operates each variant within specified times, or the recording and tracking of events which implicitly assure performance of the particular currency item.

5.3 In the event that the manufacturer or air carriers desire that less conservative currency requirements apply, T4 tests may be conducted. These tests may be done prior to Part 121 service. In the event tests cannot be done before TC/STC, the aircraft may enter service using the FSB conservative limits until results on T4 establish that less conservative currency requirements can apply.

5.4 After the aircraft enters service, the currency requirements are also validated by enroute inspection and may be adjusted by the FSB on the recommendation of principal inspectors.

5.5 Typical criteria used by the FSB to set level B, C, D, or E currency for initial FSB determinations include the following:

(a) Complex flight critical systems affecting control or navigation (EFIS, FSM, FGCS) - three segments/30 days;

(b) Critical normal maneuvers differing between variants (takeoffs/landings) - three cycles/90 days:

(c) Critical non-normal maneuvers differing between variants (V1 cut, emergency descent) - one acceptable demonstration/training or checking event (typically six months but demonstration period may also vary by crew position) ;

(d) Secondary systems (oxygen, APU) - one cycle/12 months.

5.5.1 At level E a specification is made for acceptable methods of compliance with Part 121 takeoff and landing currency.

SECTION 6. Initial or Transition Training/Checking Program Validation - Test 5 (T5) - (Applicable to a new aircraft type or to a derivative aircraft when level E is assigned).

6.1 When a new aircraft type is introduced or major handling differences are found as a result of a prospective derivative aircraft failing T2, T5 is required. T5 is analogous to T3 but is used to define training and checking

requirements for level E rather than levels C or D.

6.2 The manufacturer develops a training program to qualify and check crewmembers in the level E new or derivative aircraft. Subjects are trained, given flight checks per Part 61, Appendix A, and complete LOF in a process similar to the one described in section 4.

6.3 LOF evaluations address pertinent factors as those described in section 4 of this attachment.

6.4 When an aircraft is assigned level E as a result of a failure of T3 at level D, credit for documentation, testing and previously identified requirements may be made so that T5 need not repeat elements of T3. In the event T3 outcomes are not certain, agreement on T3 failure credits for T5 should be made prior to conduct of T3.

